# FAA Safety BRIEFING

March/April 2014

*Your source for general aviation news and information*

## Getting Back in the Game

9 Retracing Footprints in the Sky

Tips on Tackling Transition Training

Managing a Crew of Just You!



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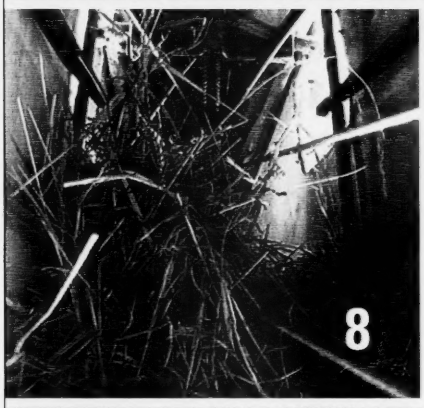
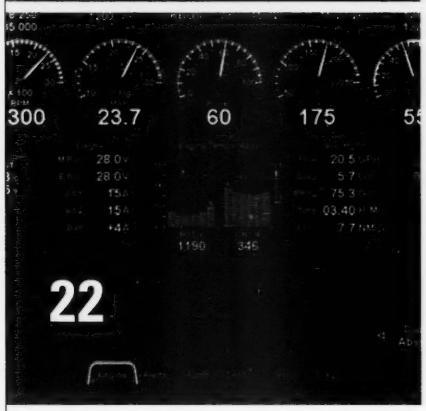
*FAA Safety Briefing* is the FAA safety policy voice of non-commercial general aviation.

The March/April 2014 issue of *FAA Safety Briefing* takes a look at what it takes to "get back in the flying game." Whether it's transitioning to a new type of aircraft, or returning from a flying hiatus, the articles here will provide safety and training advice and help you fine tune your plan for returning to the skies.






## Features


8 **Don't Let Your Flight Go A-Fowl** Keeping Your Metal Bird Free of Nests
by Frank Conway

9 **Getting Back in the Game** Retracing Footprints Left in the Sky
by Tom Hoffmann

13 **Hands Off** Preventing Stalls with the Proper Use of Trim
by Gene Hudson

16 **Shifting Gears** Tips for Tackling Transition Training
by Susan Parson

19 **All Hands On Deck** Managing the Mission with a Crew of Just You
by Susan Parson

22 **Total Recall** How Flight Data Monitoring Can Help Improve Your Skills
by James Williams

24 **Watch Out Below** What's Your True Altitude?
by Bob Maynard


## Departments


1 **Jumpseat** – an executive policy perspective

2 **ATIS** – GA news and current events

7 **Ask Medical Certification** – Q&A on medical certification issues

27 **Checklist** – FAA resources and safety reminders

28 **Nuts, Bolts, and Electrons** – GA maintenance issues

29 **Angle of Attack** – GA safety strategies

30 **Vertically Speaking** – safety issues for rotorcraft pilots

31 **Flight Forum** – letters from the Safety Briefing mailbag

32 **Postflight** – an editor's perspective

**Inside back cover** **FAA Faces** – FAA employee profile

JOHN DUNCAN
DIRECTOR, FLIGHT STANDARDS SERVICE

# Making a Game Plan

The theme for this issue of *FAA Safety Briefing* — getting back into the flying game — has special meaning for me. Like many other pilots, I have been sidelined from my normal weekend flying by a medical issue. As my family will attest, that hasn't stopped me from thinking about flying, talking about flying, and eagerly anticipating the time when I can once again grab my gear, don my headset, and take the controls of my trusty Piper *Cherokee*. We will all be glad when I can stop talking and start doing once again. The "we" includes my airplane, by the way. My *Cherokee* is lonely, and increasingly fed up with the apologies I offer it when I make periodic check-in visits to the hangar.

Although I have logged quite a few hours in a number of different aircraft over the years, most recently in the *Cherokee*, I am intensely aware that getting back into the flying game will involve some effort on my part. If there's anything I've learned in my years as a pilot, instructor, evaluator, and aviation regulator, it is the fact that aviation knowledge and skills are as perishable as muscle tone. An athlete who hasn't kept up with exercise or drills to keep game proficiency isn't going to do very well if suddenly sent back onto the field. A sidelined pilot is no different. Launching into the sky without refreshing aviation knowledge and scrubbing the rust off flying skills is unlikely to result in a safe flight.

With that in mind, I am making a game plan for returning to the sky. I share it here in the hopes that it may be helpful to fellow aviators who, for whatever reason, have been out of the flying game for some period of time.

### Caring for a Key Player (the Airplane!)

I've been making regular visits to my *Cherokee*, but it's been awhile since it actually flew. If your airplane has been similarly ground-bound due to weather, pilot illness, or the demands of daily life, you'll want to spend some time ensuring that everything is in order. After all, the pilot and the airplane are every bit as much a team as a jockey and a racehorse. The jockey isn't going very far — and certainly won't win the race — unless the mount is up to doing its part.

A pilot needs an airworthy airplane. That means that your aircraft has to conform to its type design, and it needs to be in a condition for safe flight. Part of my game plan is to review all my *Cherokee*'s documents and maintenance records. Are the annual and other required inspections current? Are there any Airworthiness Directives (ADs) I need to accomplish? Is my registration valid?

**I am well aware that getting back into the flying game will involve some effort on my part.**

Another part of the game plan — regardless of the *Cherokee*'s legal status — is to have my aviation maintenance technician perform a very thorough inspection of, well, everything. Bad things can happen to airplanes that don't get to fly. Finding and fixing problems on the ground is literally the only way to fly.

### Toning the Aviation Muscles

My day job gives me a unique opportunity to stay abreast of aviation regulatory developments, and being around pilots helps as well. Still, I know that my general aviation flying knowledge can benefit from a refresher, and so can my flying skills. No matter how much previous training and experience I have, I need a coach — known in aviation as a certificated flight instructor (CFI) — to make me airworthy and game-worthy. Even if it's not legally required, a thorough flight review tailored to my individual circumstances is a great way to accomplish that goal. And, if I plan to fly instruments, my game plan should include an instrument proficiency check. There are lots of FAA and industry resources (including free online courses) available to help us execute our game plans. Plus, CFIs are always delighted to see their fellow aviators, so see you in the sky!

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### QR Codes Enhance AeroNav Charts

Last fall, AeroNav introduced a small, but helpful feature on all of its charting products: Quick Response (QR) codes that points pilots to additional flight information sources. QR codes are the special box-shaped barcodes that, with the aid of a smartphone, can be scanned and have you directed to a specific website or email address.

According to Eric Freed, FAA Enroute and Visual Charts Group Manager, "Each QR code will direct the pilot to a series of web-links that will provide easier access to important/updated flight information to be used during the flight planning process." These include Notices to Airmen (NOTAMs), Temporary Flight Restrictions (TFRs), and chart update bulletins. Be sure to check out this time- and space-saving tool on your next flight!

### Aviation Maintenance Human Factors Site Overhauled

Last fall, the FAA's Human Factors in Aviation Maintenance website was redesigned and streamlined, giving it an appearance more consistent with other content on www.faa.gov. The site focuses on aviation maintenance human factors research which helps to identify and optimize the factors that affect human performance in maintenance and inspection.

Available features on the new site include a searchable library, a human factors return on investment calculator, and an assortment of useful tools and resources.

To check out the site, you can use the site's old URL – http://hfskyway.faa.gov/ or go to www.faa.gov/about/initiatives/maintenance_hf/.

### NTSB Issues New GA Safety Alerts and Most Wanted List

The National Transportation Safety Board (NTSB) issued five new Safety Alerts last December that provide GA pilots with mitigating strategies for preventing accidents. A Safety Alert is a brief information sheet that pinpoints a particular safety hazard and offers practical remedies to address the issue.

The five new Safety Alerts issued are:

- Check Your Restraints
- Engine Power Loss Due to Carburetor Icing
- "Armed" for Safety: Emergency Locator Transmitters
- All Secure, All Clear (securing items in the aircraft cabin)
- Proper Use of Fiber or Nylon Self-Locking Nuts

According to NTSB chairperson Deborah A. P. Hersman, "these five Safety Alerts remind pilots, mechanics, and passengers of basic safety precautions to add to their checklists to ensure a safe flight for all on board."

The five GA Safety Alerts released, as well as the 25 others issued since 2004, are available at http://go.usa.gov/2BeA.

Shortly after the Safety Alerts were issued, the NTSB also unveiled its latest "Most Wanted" list designed to increase awareness of a broader group of transportation safety issues. General aviation returns to the list this year, but with a greater focus on the role of hazardous weather in GA accidents. An NTSB fact sheet on the topic states that about two-thirds of all GA accidents that occur in instrument meteorological conditions (IMC) are fatal — a rate much higher than the overall fatality rate for GA accidents. Hazardous weather is often the cause or a contributing factor to these accidents.

The FAASTeam has recently developed an online training course that offers pilots a systematic approach to collecting and understanding weather information for their flight. It also explains new weather technologies. All GA pilots should take this course entitled "Aviation Weather Data - A Targeted Approach" (ALC-322). You can find it at: http://go.usa.gov/BqbW.

Other aviation-related items on the Most Wanted list include the unique characteristics of helicopter operations, eliminating distractions, and strengthening occupant protection systems. A detailed fact sheet on each of these topics can be found at www.ntsb.gov/safety/mwl.html.

## Airman Testing Standards and Training Update

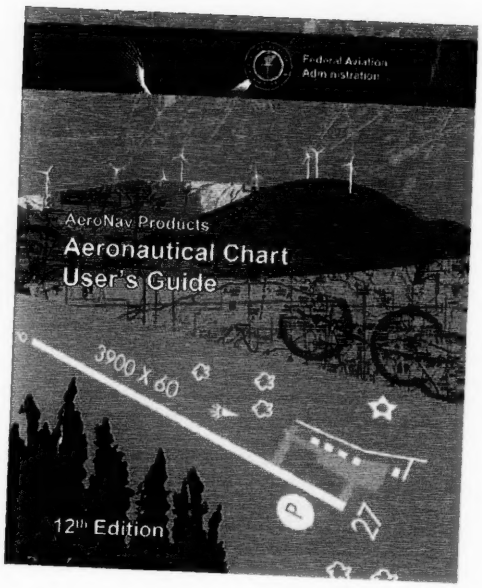
To keep pace with advances in technology and educational training methods, the FAA chartered the Airman Testing Standards and Training Aviation Rulemaking Committee (ARC) in September 2011 to engage stakeholders to recommend ways to improve the quality of general aviation airman knowledge, computer testing supplements, guides, practical test standards, and training handbooks. The ARC also considered how to develop test questions that incorporate expert input and review while balancing the need to safeguard test integrity. The ARC's report is available at www.faa.gov/aircraft/draft_docs.

To implement key ARC recommendations, the FAA tasked an Aviation Rulemaking Advisory Committee Working Group in August 2012 to develop integrated airman certification standards documents, guidance, and test materials for the private pilot and instructor certificates and instrument rating. The FAA also tasked this group to propose how to realign, streamline, and consolidate existing FAA guidance material with each of the integrated Airman Certification Standards (ACS) documents and ensure that knowledge test item bank questions are consistent with both the ACS documents and the ARC's recommendations.

On September 30, 2013, the ARAC submitted the working group's final report to the FAA (http://go.usa.gov/ZvR3) with recommendations to improve airman training and testing by establishing an integrated, holistic airman certification system that clearly aligns testing with certification standards, guidance, and reference materials, and maintains that alignment. The group recommended steps the FAA should take to adopt the proposed ACS approach and its ongoing management. In January, the FAA published a notice in the *Federal Register* to establish an Airman Certification System Working Group to help the agency ensure that the content of its ACS, guidance, and knowledge testing materials is relevant and current; and that all components of the airman certification system are aligned. The group's charter runs through December 31, 2015.

## Aeronautical Chart User's Guide Updated

The FAA has made available its 12th edition of the Aeronautical Chart User's Guide available for download at http://go.usa.gov/BQ5k. This guide is an introduction to the FAA's aeronautical charts and publications and is useful to new pilots as a learning aid, and to experienced pilots as a quick reference guide.




This publication explains all the symbology used on the FAA world aeronautical charts, sectional aeronautical, terminal area, flyway planning, helicopter route, enroute low- and high-altitude, area, and oceanic route charts, as well as standard terminal arrival routes, standard instrument departures, and instrument approach procedures.

## New UAS Sites Chosen

The FAA last December announced the locations of six unmanned aircraft systems (UAS) research and test sites around the country. These test sites will conduct critical research into the certification and navigation requirements needed to safely integrate UAS into the national airspace over the next several years.

In selecting the six test sites, the FAA considered geographic diversity, climatic diversity, location of ground infrastructure, research needs, airspace use, safety, aviation experience, risk, and economic impact.

The six test sites are: University of Alaska, the state of Nevada, New York's Griffiss International Airport, the North Dakota Department of Commerce, Texas A&M University – Corpus Christi, and Virginia Polytechnic Institute and State University (Virginia Tech).

The FAA is confident that with the help of these six test sites, the agency will meet its research goals of System Safety & Data Gathering, Aircraft Certification, Command & Control Link Issues, Control Station Layout & Certification, Ground & Airborne Sense & Avoid, and Environmental Impacts.

Each test site operator will manage the test site in a way that will give access to parties interested in using the site. The FAA's role is to ensure each operator sets up a safe testing environment and to provide oversight that guarantees each site operates under strict safety standards. The FAA also has

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Published six times a year, *FAA Safety Briefing*, formerly *FAA Aviation News*, promotes aviation safety by discussing current technical, regulatory, and procedural aspects affecting the safe operation and maintenance of aircraft. Although based on current FAA policy and rule interpretations, all material is advisory or informational in nature and should not be construed to have regulatory effect. Certain details of accidents described herein may have been altered to protect the privacy of those involved.

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## CONTACT INFORMATION

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- Emailing: SafetyBriefing@faa.gov
- Writing: Editor, *FAA Safety Briefing*, Federal Aviation Administration, AFS-805, 800 Independence Avenue, SW, Washington, DC 20591
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established requirements for each test site that will help protect privacy.

For more information, go to www.faa.gov/about/initiatives/uas/.

### *Sun 'n Fun 2014*

Get ready for some fun in the sun aviation style at this year's Sun 'n Fun International Fly-In and Expo, scheduled to take place April 1-6, 2014, in Lakeland, Fla. This year marks the 40th anniversary of this aviation extravaganza that attracts aviators and airplane enthusiasts from all over the globe. The event features aerial performances, exhibits, and a wide variety of educational seminars (visit www.sun-n-fun.org for more information). The FAA will also host a series of safety forums between 0830 and 1400 each day at the FAA Safety Team's National Resource Center. NTSB Board Member Dr. Earl Weener is scheduled to speak there on April 2 as well as U.S. Rep. Sam Graves who will host a general aviation town hall discussion on April 5. See page 5 for a list of these forums, or go to http://faasafety.gov/QR/Forums.PDF.

And if you're planning to fly to Sun 'n Fun, don't forget to read the 2014 Sun 'n Fun Notice to Airmen (NOTAM) available at www.faa.gov/air_traffic/publications/notices.

# FAA Safety Seminars & Worksho

*Celebrating 40 years*

## SUN 'n FUN International Fly-In & Expo

*April 1-6*
2014
*Lakeland, Florida*

| | 8:30 – 9:30 | 10:00 – 11:00 | 11:30 – 12:30 | 1:00 – 2:00 |
|---|---|---|---|---|
| **Tuesday April 1, 2014** | **Maintenance Related Accidents**<br>Albert Kimball<br>FAA Safety Inspector (Retired) | **Who Runs Out of Gas?**<br>Mike Adams<br>Vice President of Underwriting<br>AVEMCO Insurance Company | **So You Want to be A CFI?**<br>Walter Schamel | **The WINGS Program Explained**<br>Dennis H. Whitley<br>FAA Safety Team Representative |
| **Wednesday April 2, 2014** | **Loss of Aircraft Control During Takeoff and Landing**<br>Earl Weener Ph. D<br>NTSB Chairman | **Analysis of GA Accidents**<br>Tony James<br>FAA Accident Investigator | **Hypoxia Awareness**<br>Dr. Paul Buza<br>High Altitude Flying | **Behind the Scenes of a "Checkride"**<br>Janeen Kochan<br>FAA Designated Pilot Examiner |
| **Thursday April 3, 2014** | **Is Your Aircraft Talking to You?**<br>Cathy Gagne<br>NTSB Investigator | **The Kings on Practical Risk Management**<br>John & Martha King<br>King Schools | **Flight Service Enhancements**<br>Speaker TBA<br>Lockheed Martin | **Runway Incursions**<br>Speaker TBA<br>FAA Office of Runway Safety |
| **Friday April 4, 2014** | **Airmen Medicals**<br>Dr. James R. Fraser<br>FAA Deputy Federal Air Surgeon | **Wright Brothers Master Pilot and Charles Taylor Master Mechanic Awards**<br>Douglas R. Murphy<br>FAA Regional Administrator<br>Southern Region | | **Meet The FAA**<br>Douglas R. Murphy<br>FAA Regional Administrator Southern Region |
| **Saturday April 5, 2014** | **Is Your Aircraft Talking to You?**<br>Cathy Gagne<br>NTSB Investigator | **Flight Service Enhancements**<br>Speaker TBA<br>Lockheed Martin | **STARTING AT 1:00**<br>**Town Hall with Congressman Sam Graves (R – MO 6th District)**<br>U.S. House Transportation Subcommittee on Aviation | |
| **Sunday April 6, 2014** | **Why Wise Pilots Choose WINGS**<br>Dennis H. Whitley<br>FAA Safety Team Representative | **Commercial Airline Passenger Safety & You**<br>Brent Harper<br>Southwest Airlines | **Flying to Sun 'n Fun this year?**<br>If so, you will need to follow this link or scan this QR code to download the latest Sun 'n Fun 2014 NOTAM.<br>(http://www.sun-n-fun.org/FlyIn/GettingHere/flying/) | |

Icons indicate availability of
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R-2.3

Official FAA Forums are held at the **FAA Southern Region Safety Center** located in the middle of the exhibit area at the corner of Laird Drive and Sun 'n Fun Drive.

The FAA Center opens daily at 8:00 a.m. and the FAA Exhibits are open daily 9:00 a.m.—3:00 p.m.

**Schedule is subject to change;**

for updates scan the QR code at the right or go to: FAASafety.gov/QR/Forums.pdf

Become a part of the FAA Safety Team, go to FAASafety.gov for more information.

(http://

# Fast-track Your Medical Certificate

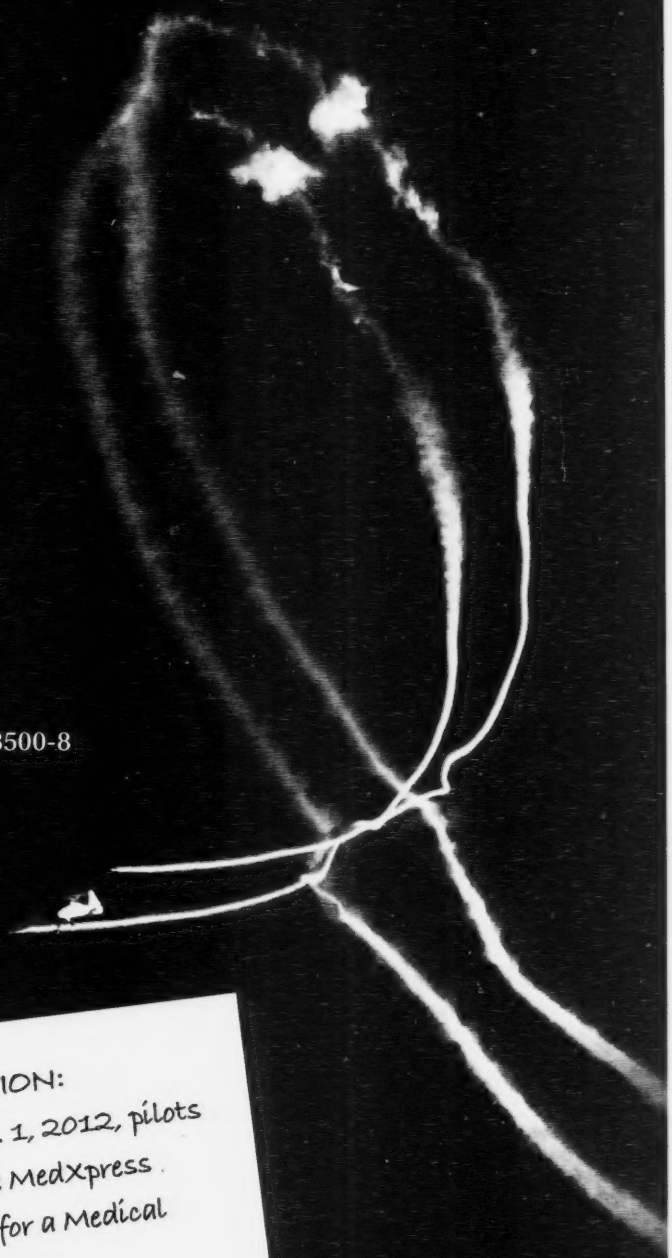
**With FAA MedXPress, you can get your medical certificate faster than ever before.**

Here's how: Before your appointment with your Aviation Medical Examiner (AME) simply go online to FAA MedXPress at https://medxpress.faa.gov/ and electronically complete FAA Form 8500-8. Information entered into MedXPress will be available to your AME to review prior to and at the time of your medical examination, if you provide a confirmation number.

With this online option you can complete FAA Form 8500-8 in the privacy and comfort of your home and submit it before your appointment.

The service is free and can be found at:

https://medxpress.faa.gov/



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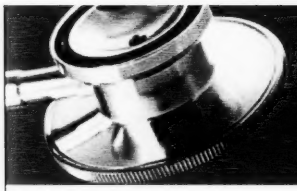
As of Oct. 1, 2012, pilots must use MedXpress to apply for a Medical certificate.



# Ask Medical Certification

COURTNEY SCOTT, D.O.
MANAGER, AEROSPACE MEDICAL
CERTIFICATION DIVISION

**Q1. I've read that it is possible for people with Type I (insulin dependent) diabetes to get a special issuance of a class 3 medical. I have also read that between 400-500 people per year are able to get this waiver, but I don't know how many applicants are denied. If it is possible to get a waiver, what is your feeling on well-controlled Type Is flying under the sport pilot rules with a driver's license in lieu of a medical?**

A1. This is a very important question and I am pleased you asked it so I can answer it for you and other airmen who have concerns about this topic. Monitoring and treatment for diabetes are changing and improving. I hope the answer I give you today will become outdated and incorrect within just a few years, but it is still the correct answer today. Insulin is the natural hormone that takes glucose from the blood stream and facilitates entrance into the cells where the glucose is needed for the body to perform its normal functions. People with Type I diabetes mellitus have an absolute lack of insulin. When insulin is administered, it must be the right dosage or there is a risk of driving the blood glucose levels too low, a condition we call hypoglycemia. Hypoglycemia can cause sudden incapacitation. Unfortunately, in Type I diabetics, hypoglycemic episodes are frequently unrecognized. The Federal Air Surgeon has developed an elaborate protocol of frequent self-testing (for blood glucose levels) to minimize the chances that the airman might suffer a hypoglycemic episode. My concern with sport pilot is that there is no requirement to follow this protocol, and therefore the likelihood of a hypoglycemic episode is beyond acceptable risk. My feeling is that it is dangerous.

**Q2. Assuming an airman self-disqualifies himself for a medical problem as required by FAR 61.53, and the condition is temporary, can he now self-certify himself as being ok to fly once his condition has passed? An example; while playing football a pilot takes a real hard hit and is staggered and feels dizzy for a couple days, so he self-disqualifies and doesn't fly for a week. Now he's feeling better ...? If this is addressed in an FAR, can you please tell me which one?**

A2. This is an outstanding question. If at any time an airman is unsure about a situation like this, I would advise consulting with either an Aviation Medical Examiner or someone in the Regional Flight Surgeon's office. For the specific question mentioned, there is a significant chance there was actually a concussion. Remember, concussion may occur without loss of consciousness. Therefore, in this case, I would advise to submit all of the medical records concerning the event. More testing may or may not be required.

**Q3. I have a 2nd class medical and was diagnosed with Non-Hodgkin's, slow-growing follicular lymphoma. My medical just reverted to a 3rd class since it's been just over a year since my 2nd class medical. I want to go and get my 2nd class medical, but I don't know the implications of exactly what will happen. Will my medical be denied so that I cannot fly as a sport pilot? Will it be deferred by my AME to the FAA? I am on Cladribine and Rituxin. Up until this time I have just completed four rounds of treatment and have felt no side effects and it has not caused me to make any changes in my life. I asked my treating oncologist what impact this treatment will have on my flying and his answer was: "since it hasn't affected your flying now, why should it?" What is the best way to go forward with this?**

A3. Special Issuance, including AME Assisted Special Issuance, has often been possible with Non-Hodgkin's Lymphoma, once the disease is in full remission. We would need the complete medical records for the diagnosis and treatment of this condition to make a definitive determination. Rituxan has been allowed as a treatment. We have not yet approved Cladribine, but it could be requested for review. Remember, CFR part 61.53 still applies to sport pilot. Therefore, I believe your best bet is to go for special issuance. Be patient, but you have an excellent chance of combining the absolute optimal therapy for the cancer, yet still being able to fly.

**Send your questions to SafetyBriefing@faa.gov. We'll forward them to the Aerospace Medical Certification Division without your name and publish the answer in an upcoming issue.**

*Courtney Scott, D.O., M.P.H., is the Manager of Aerospace Medical Certification Division in Oklahoma City, OK. He is board certified in aerospace medicine and has extensive practice experience in civilian and both military and non-military government settings.*

# Don't Let Your Flight Go A-Fowl

## *Keeping Your Metal Bird Free of Nests*

FRANK CONWAY

Spring is a season of pleasant activity. Trees bud, flowers bloom, the mercury rises. To the chagrin of many pilots, though, spring is also the time when scores of our nested avian friends return from their winter roosts. Thankfully, there are many programs that can help aviators successfully avoid the hazard of an in-flight encounter with a bird or a flock of birds. However, another more subtle bird hazard lurks for the unsuspecting aviator — birds nesting in the aircraft engine compartment.

General aviation (GA) aircraft may sit idle on the ramp for weeks or even months at a time, making them perfect targets for nesting sites. That makes being proactive with bird-proofing your aircraft critical, as birds need only a few days to build a reasonably sized nest. While aircraft plugs and covers block most open access points, they do not completely seal the aircraft fuselage and engine compartments. GA aircraft with retractable landing gear may provide access to the engine compartment via the recess that accommodates the nose gear in flight. A bird that manages to enter the engine compartment from one of these openings can build a large nest in an area of the aircraft that is not specifically included on a preflight inspection checklist, and not easily seen in even the most thorough preflight inspection.

Photo by H. Dean Chamberlain

To highlight the insidious nature of these avian engineers, here's a look at an example of an undetected nest that may have had disastrous results. During a training flight, a certificated pilot rented and flew a single engine airplane with retractable gear. The pilot observed no anomalies during the 90-minute flight. A post-flight inspection of the aircraft found nothing unusual.

The next day, another pilot preflighted the same rental aircraft prior to his scheduled flight. During the preflight inspection, the pilot noted an area of burned skin on the lower engine cowling aft of the engine compartment louvers. This external indication of fire was not detectable until the pilot was close enough to check the security of the lower cowling fasteners. The fact that the second pilot almost missed seeing this burned skin underscores the point that it was not easily detected during the previous post-flight inspection.

Naturally, the flight was cancelled. A maintenance inspection revealed that a bird's nest had been located behind the cowling in an area not detectable during preflight. The fire had occurred during the previous flight, and it caused significant damage to the starter cable as well as possible damage to the engine mounts.

During the first pilot's flight, the bird's nest provided combustible material that most likely ignited after landing, when the air flow in the compartment was static and the nearby exhaust stack was likely to be at a high temperature (due to turbocharger bypass at lower power settings). The hazards associated with an inflight fire are significant, and good fortune prevented this potentially hazardous situation from ending with a more severe outcome.

To mitigate the dangers associated with bird nest construction, consider following these steps:

1. Although not called for in the preflight procedures, use an inspection mirror and flashlight aimed through any opening to get a better look at areas where bird nests can occur.
2. In addition to using the plugs provided by the manufacturer, consider developing custom, removable plugs properly tagged "REMOVE BEFORE FLIGHT" for all engine compartment openings large enough to permit birds to enter. (*Please note, however, that such action may result in bird penetration to other parts of the aircraft. Birds are very determined creatures that can fit through remarkably small openings. Each aircraft and situation is different, so every action you take should be specific to your particular aircraft.*)

---

*Frank Conway is a former certification pilot with FAA's New York Aircraft Certification Office and is currently employed as an experimental test pilot with The Boeing Company.*

TOM HOFFMANN

# Getting Back in the Game

## *Retracing Footprints Left in the Sky*

Maybe you're married, have kids, and consider 20 minutes of free time a vacation. Perhaps a recent operation or medical condition has you worried whether you're fit to fly. Or, maybe the dust on your logbook triggers anxious thoughts of policies and procedures that have changed and now must be relearned.

These are all understandable reasons for a pilot to hang up the headset for a while, but they don't have to mean a permanent grounding. If the flying flame still flickers within, the opportunity to soar once again is yours for the taking. You may be surprised how easy it can be to get started again. With a solid plan and determination, along with the benefits of some exciting developments, you can easily shake off that rust and get back to enjoying the freedom only flying can offer.

Your first question is likely: With so many changes to consider, how do I even get started? There's no doubt getting back into flying after a long break can be daunting. I know. Before getting airborne again a few years back, my sectionals still depicted a magenta-checkered Airport Radar Service Area (ARSA) pattern around my home airport, Long Island MacArthur Airport. Looking through my old flight bag made me feel like Rip Van Winkle waking up from a nap (thankfully, without the white hair). I had my work cut out for me, but I knew nothing would keep me from returning to the skies.

### A Personal Preflight Check

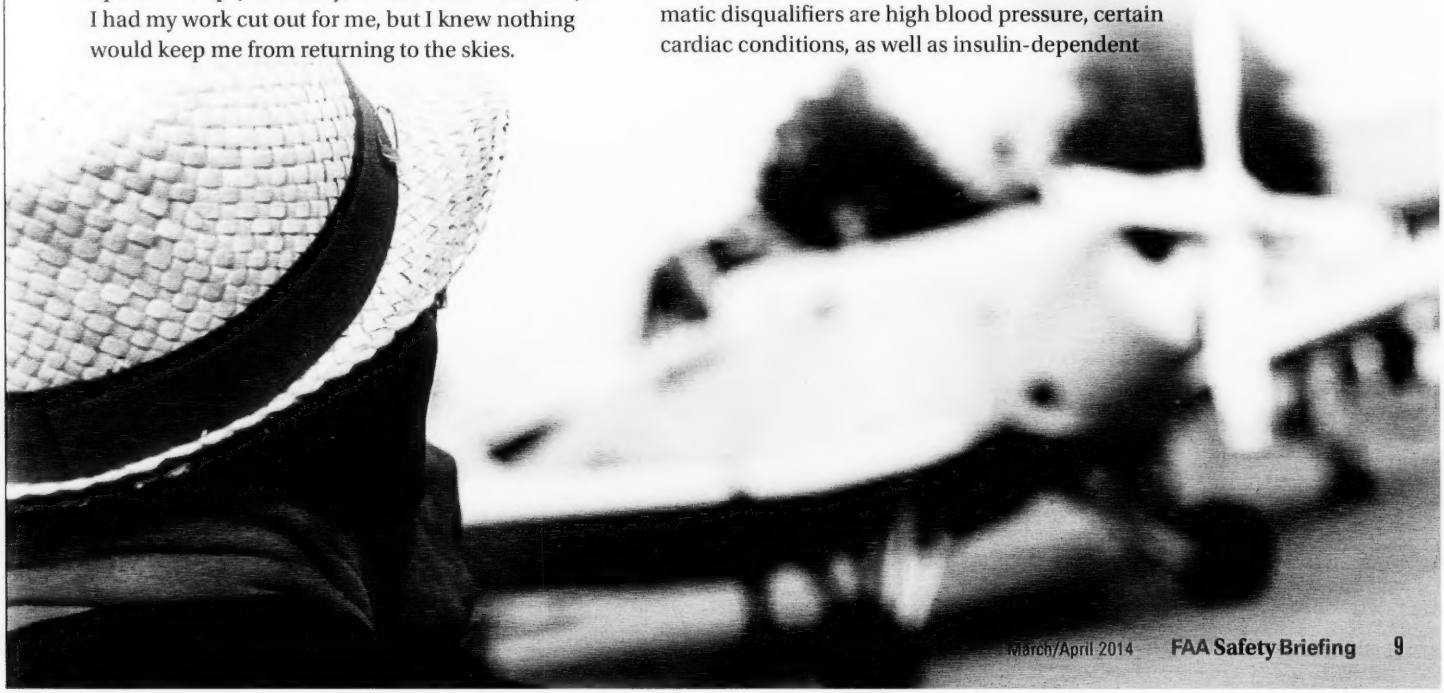
Whether it's been decades or just a couple of years, the best way to get back in the game is to start with a plan. Begin by exploring why you stopped flying. I highlighted a few reasons earlier, but among the most common relate to time, money, and medical issues.

Ask yourself what it is that's drawing you back. Are you returning to complete an unfinished rating? Maybe there are career or volunteer opportunities calling your name. Or, perhaps you simply would like to enjoy the freedom of flight once again. Depending on how long it's been since you've flown, you may be unaware of some changes that could make the prospect of returning to flight less overwhelming than you think. Let's take a look at some scenarios to see how they might apply to your situation.

### Medical Policy Makeovers

The first step for many returning pilots is an assessment of personal health and fitness. Thankfully, there have been many favorable changes in the last 15 years to help pilots retain a current medical certificate. What may have been disqualifying years earlier may now be acceptable with revised waiver and special-issuance guidelines.

Among the conditions that are no longer automatic disqualifiers are high blood pressure, certain cardiac conditions, as well as insulin-dependent



diabetes (third-class only). In addition, the FAA has identified a series of medical conditions that enables Aviation Medical Examiners (AMEs) to re-issue an airman medical certificate without going through the normal special issuance process. Among these recently exempted conditions, provided they meet acceptable parameters, are arthritis, hyper- and hypothyroidism, prostate cancer, and asthma. For a complete list, as well as a corresponding worksheet you'll need for each of these exempted conditions, reference the Aviation Medical Examiner (AME) Guide online at http://1.usa.gov/187odaU. Keep in mind that although these conditions no longer require a special issuance, they will still need to be reported to your AME. The AME will then review records from your treating physician to ensure everything is safe.

**The best way to get back in the game is to start with a plan.**

Another change worth mentioning is that the FAA Office of Aerospace Medicine now permits special-issuance medical certificates for airmen who are being treated with certain anti-depressant medication. The impact of this change is substantial, as it could affect thousands of pilots currently diagnosed with mild to moderate depression.

Before you meet with your AME, you'll be required to use FAA's MedXPress system (medxpress.faa.gov) to process your medical certificate application online. The system has proven to be faster, more accurate, and easier for both you and your AME. First time users to MedXPress may want to refer to the article "Take the Express Lane" in the January/February 2013 issue of *FAA Safety Briefing*.

When it's time to meet with the doctor, be upfront and honest about any medications you are taking or any changes to your health. It's also a good idea to work with a physician before your medical to try to resolve any issues, as well as gather the necessary documentation your AME will need to process your case. A good statistic to keep in mind is that only one percent of airmen have their applications denied. Of those denials, a majority are due to a lack of proper documentation. Many of those applicants eventually go on to get a medical. Only about 0.1 percent of applications result in a final denial.

For more on getting your medical, contact your local AME or go to the medical certification section of www.faa.gov.

## Lighten Your Load

A big change that opened doors for more pilots to regain the freedom and fun of personal flying was the Sport Pilot/Light-Sport Aircraft (SP/LSA) rule, implemented in 2004. Under this rule, pilots may operate aircraft that fall within certain reduced weight and speed parameters, and are required only to have a valid U.S. driver's license to validate medical fitness. One caveat, however: If you previously held a medical certificate, your most recent certificate must not have been denied, revoked, or suspended.

One aspect of SP/LSA is that it offers those watching their pennies a more affordable option to return to flight. Some LSA aircraft can be rented wet for close to a $100 an hour. These aircraft save on gas as they typically burn 3-5 gallons per hour, much less than a standard single-engine trainer. If you already have a private- pilot certificate, you can legally fly an LSA provided you are current and it is in the same category you're checked out in. An important safety precaution: LSAs can have different handling characteristics so it's a good idea to get checked out with an instructor first. (See this issue's *Angle of Attack* department and the article "Shifting Gears" for more on transition training)

## Relearn Your ABCs

An important task for anyone returning to flying is getting up to speed on regulatory changes, especially those pertaining to airspace use. To avoid any visits from your local F-16 fighter squadron, be sure to study up on airspace changes, particularly in areas like Washington, D.C. that have adopted a permanent Special Flight Rules Area (SFRA) and Flight Restricted Zone (FRZ). A special training course on flying in this area is offered at www.FAASafety.gov.

There's also the matter of Temporary Flight Restrictions (TFR), which, since September 11, 2001, are used routinely to restrict airspace for 30 miles for presidential visits or large-scale sporting events, like the Super Bowl. TFRs can pop up unexpectedly so before any flight, be sure to research NOTAMs, check the FAA TFR list (http://tfr.faa.gov/tfr2/list.html), and call the Flight Service Station (1-800-992-7433) for updates.

Now, for those who recall Ronald Reagan or George H. W. Bush as being in office during your last flight, you'll need to take time to review the changes that resulted from the FAA's reclassification of the U.S. airspace system in 1993. The changes removed terms like TCAs and control zones, and replaced them with the ICAO-compliant titles that range from Class A to Class G airspace. For more information, see chapter 3 of the *Aeronautical Information Manual* (AIM) or chapter 14 of the *Pilot's Handbook of Aeronautical Knowledge*.

As far as regulations go, Title 14 Code of Federal Regulations (14 CFR) part 61 went through some significant changes as well over the years, including:

- Changes to duration of medical certificates for pilots under 40 (61.23)
- Tailwheel aircraft endorsement requirement (61.31)
- Logging of PIC time (61.51)
- Changes to instrument currency and rating requirements (61.57, 61.65)
- Revised definition of "complex" aircraft (61.1)
- student pilots now allowed to train and apply for a private pilot certificate and instrument rating concurrently (61.65)
- allowance for a current or former military pilot/examiner to obtain a CFI certificate (61.73 (g))

## Fill the Right Seat with the Right Person

Successful reentry to flying requires the guidance of a good instructor; don't overlook this important step. Find an instructor who understands your situation and is willing to take extra time to help you get back in your game. Be clear about your intentions and work together to set attainable training goals. Since you may have a lot of ground to cover, don't be afraid to ask questions or request a review of any segments of flying you feel out of touch with, like stalls or steep turns.

When it's time to start flying, don't be too hard on yourself if you seem a bit out of form. My first landing after my long absence was a greaser, but on the next try, I bounced around worse than a bull rider. A few bumps can be hard to swallow, but that's to be expected when such a highly coordinated skill is put on hold for a while. The key: Remain patient and keep at it.

A good exercise to help get you primed before you even flick the master and turn the key is to spend some extra time with your pre-flight check. Follow your aircraft's checklist carefully. Spend some time in the left seat reviewing instrument and comm/nav switch locations, especially since some pilots might be in for quite a surprise once they climb in the cockpit.

This is because steadily replacing the classic "six pack" of basic instruments are shiny new glass-panel displays that host a suite of new features made possible by the advent of GPS technology. If this is completely unfamiliar to you, consider getting your "air" legs before tackling a Garmin 1000. Better yet, make unlocking the benefits of GPS a fun incentive for you to continue with your flying.

## Flight Review and Done?

It's been said that a pilot certificate is a license to learn, and whether you're an active pilot or one on hiatus, this couldn't be more accurate. Much like a checkride for a new rating, a flight review shouldn't mark the end of your learning process.

"Don't be content with just passing your flight review," says Dan Williams, a Maryland-area private pilot who is familiar with returning to flying after a few dry spells. "Make an effort to expand and test your knowledge in all areas. And, if you're not asked to do it on your check, ask for it to be reviewed. This will help you feel more confident when you're on your own again."

**Successful reentry to flying requires the guidance of a good instructor.**

Staying proficient on the ground is important, too. This is where FAA's WINGS Pilot Proficiency Program can help. Designed to help encourage a commitment to safety education, the program currently enrolls more than 143,000 airmen who earn credits by completing online courses and attending safety seminars. Those who complete a basic phase of WINGS will get credit for the flight review requirements covered in 14 CFR part 61.

## Help, I'm in a Holding Pattern and Can't Get Out!

Was this article about you — with a burning desire to get back in the cockpit, but in a current

holding pattern due to family and/or career commitments? That's okay. While the timing might not be ideal now, that could soon change. The key is to maintain the interest and enthusiasm in flying by keeping up with aviation news and training, whether through periodicals, like this one, and/or aviation websites, such as www.FAASafety.gov and www.aopa.org. You can also attend local air shows or fly-ins, perhaps to lend some time and expertise as a volunteer. Check with your state aviation authority for events in your area too.

Staying involved and immersed in aviation in whatever capacity possible will be the next best thing to being airborne and it'll keep your engine primed for when you return. Don't worry, the sky is waiting!

*Tom Hoffmann is managing editor of* FAA Safety Briefing. *He is a commercial pilot and holds an A&P certificate.*

### Helpful Links to Get You Back in the Air

**FAA Medical Certification home page**
www.faa.gov/pilots/medical

**FAA MedXpress form**
https://medxpress.faa.gov

**Aeronautical Information Manual (AIM)**
http://www.faa.gov/air_traffic/publications/ATpubs/AIM/

**Code of Federal Regulations**
(Search Title 14, click Parts 60 - 109)
www.ecfr.gov

## The General Aviation Awards Program

*Searching For Aviation Excellence*

For 50 years the General Aviation Awards Program has been a cooperative effort between the FAA and about three dozen GA industry sponsors. The mission of the program is to recognize aviation professionals on a local, regional, and national level for their excellence and long-term contributions to GA and flight safety.

There are four categories of awards: Flight Instructor, Aviation Maintenance Technician, Avionics Technician, and FAA Safety Team (FAASTeam) representative. National winners are recognized during EAA's AirVenture in Oshkosh, Wisc. They receive expense-paid travel to and accommodations at AirVenture, as well as gifts provided by sponsors and contributors.

"Next year's national winners are out there," offers Arlynn McMahon, Team Leader of the Awards Program Committee. Applications for 2015 awards are accepted July 1 thru September 30, 2014. "They probably don't think of themselves as national winners, but rather as aviation professionals who work hard to serve their clients and improve our industry. These are the kind of people we want to select to represent their peers and our industry in 2015."

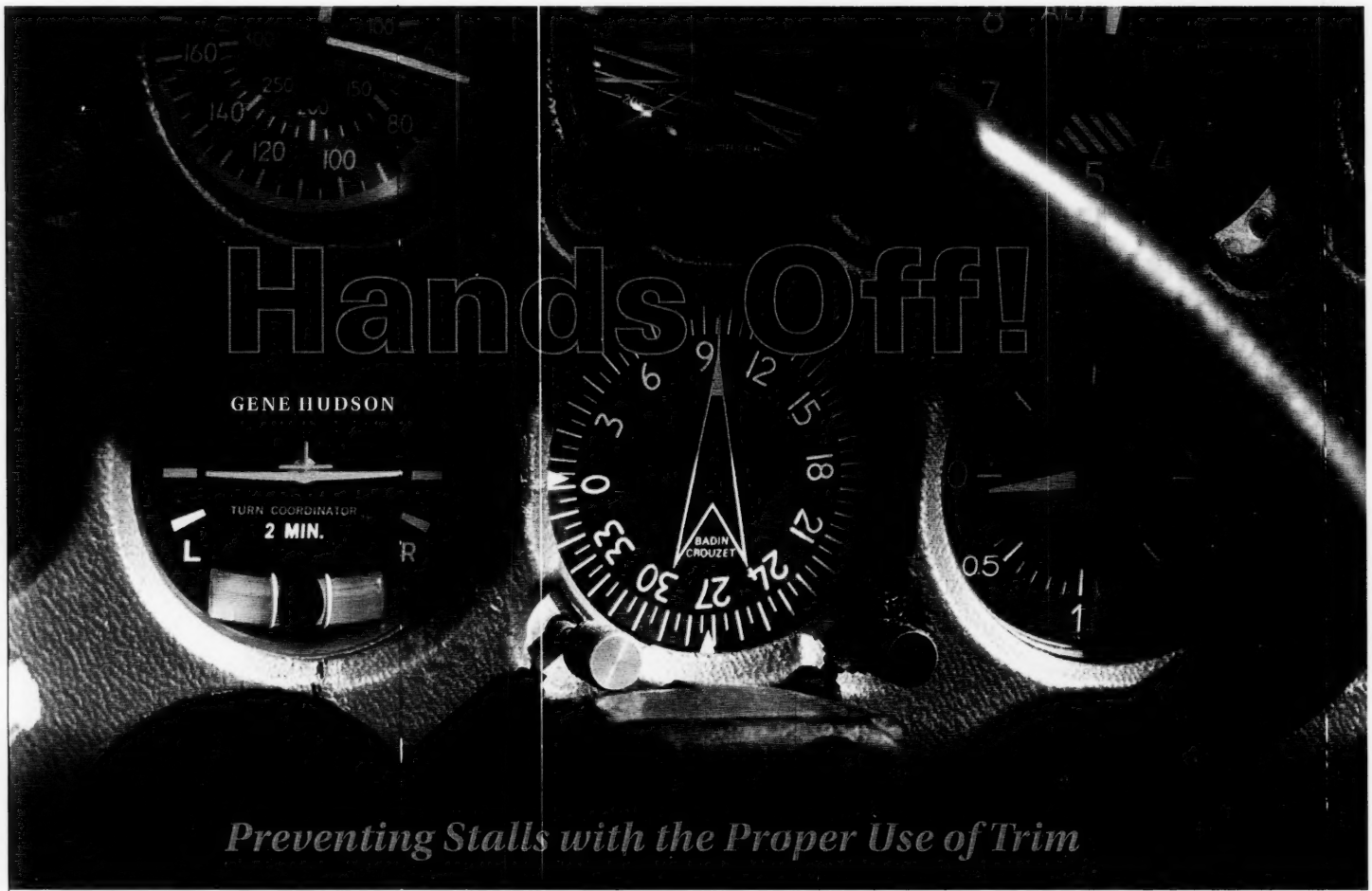
McMahon, who was 2009 National Flight Instructor of the Year, was installed as Team Leader of the Awards Committee in January. The committee consists of prior national award winners, FAA, and sponsors.

***From left to right: 2013 FAASTeam MCFI Mark Madden, 2013 Avionics Tech Bruce Lundquist, JoAnn and Sandy Hill (representing the GA Awards Committee), 2013 CFI Dean Eichholz and 2013 AMT William Fifles***

"This program is unique because both the FAA and industry seek out those individuals who possess the traits that are seen as 'the-best-of-the-best,'" says McMahon. "It's a 50 year program and it's still valid today because holding the bar high, being the best, and striving for excellence is always in style."

This year the Awards Committee is expanding its Board of Directors, partnering with new awards sponsors, and adding transparency to the inner-workings of the committee.

Find prior winners, applications, selection criteria, sponsorships, and more at www.generalaviationawards.org or email questions to info@generalaviationawards.org.




# Hands Off!

## *Preventing Stalls with the Proper Use of Trim*

GENE HUDSON

Year after year, stall/spin events account for a disturbing number of general aviation accidents. According to the Air Safety Institute's Nall Report, "failure to maintain airspeed" appears as a proximate or contributing cause in roughly 40 percent of the fatal accidents. This statistic persists in spite of stalls, stall recovery, and stall prevention having been taught — *ad nauseam* — to virtually every candidate for every certificate, rating, flight review, insurance checkout, and type certificate over the last half-century, or more.

Someone once defined insanity as "doing the same thing over and over and expecting a different result." It is the opinion of this author — a long-time flight instructor — that the results demonstrate that we in the flight instruction profession are not giving our customers an adequate methodology for dealing with this problem. Specifically, we do not provide a sufficiently clear and effective means of preventing unintentional stalls. This article is an attempt to define such a methodology.

Central to the problem of the prevention of unintentional stalls is a general misunderstanding of how and why an aircraft will stall. Too often, we hear discussed the aircraft's stall speed; in fact, the aircraft stalls if, and only if, the wing exceeds the critical angle of attack. That this will occur at a particular speed is only true given a closely-defined set of conditions. Any stall speed is only valid at a particular combination of weight and load factor; the critical angle of attack does not change as long as the flap configuration is constant.

A second concept that is poorly understood is the issue of trim and stability. Pilots tend to think that the aircraft trims to an airspeed; this, also, is only true under particular circumstances. The static stability of an airplane tends to drive it back to a trimmed angle of attack. This will correspond to a particular airspeed only under steady-state conditions.

**The stability of the aircraft can be used to the pilot's advantage with regard to stall prevention.**

The stability of the aircraft can be used to the pilot's advantage with regard to stall prevention. In a nutshell, let go of the controls. Once the controls are released, the aircraft will return to the trimmed angle of attack (regardless of the airspeed) within a little more than a second. Most aircraft will not trim to an angle of attack that exceeds the critical angle of attack; thus, with very rare exception, an aircraft loaded forward of the aft center of gravity limit cannot be stalled in hands-off flight.

Unintentional stalls, then, occur when the pilot applies enough backpressure on the yoke to overcome the natural stability of the aircraft, leave the trimmed angle of attack, and exceed the critical angle of attack. It would seem, then, that we could eliminate unintentional stalls by warning pilots to avoid applying excessive backpressure. One would think this would work. History tells us, however, that it does not. Discovering the reason for this paradox requires bringing some outside knowledge into play. In particular, I find it helpful to consider the 19th century contributions of German anatomist and physiologist Ernst Heinrich Weber (1795-1878), and his student, physicist and philosopher Gustav Theodor Fechner (1801-1887).

**An airplane in trim and flown hands off is (with rare exception) impossible to stall. When a pilot does have to make a control input, it is better to touch the yoke, rather than to grip it.**

These two scientists developed the theory of perception, defining the "just noticeable difference (JND)," or, in other words, the minimum change in a stimulus required to trigger perception. With regard to pressure stimulus (such as force on the yoke), the JND is a change of approximately 14 percent of the pressure already present. Today, the relationships they defined are referred to as the Weber-Fechner law, or the W-F law. It is common knowledge in physiology but, unfortunately, not so well known in aviation.

There are several features of the W-F law which are important to flight operations. First, any stimulus (yoke pressure) which is constant will, over a short time, fade from perception. A pilot who is flying in an out-of-trim condition will soon lose the ability to perceive that he or she is applying any elevator pressure at all. The out-of-trim condition becomes the new zero; the pilot cannot trim it off, because they do not perceive that it is there.

Second, a constant stimulus (i.e., steady backpressure to compensate for being out-of-trim) will elevate the just-noticeable-difference. If the pilot is holding a constant 20 lbs. backpressure, the minimum pressure change he or she can feel on the yoke is now 2.8 lbs., in any direction. Every attempt to make a "small" input will become a "small" input plus 2.8 lbs. of additional pressure that the pilot has no way to know he or she is applying. The result is over-controlling; small, precise inputs are impossible. Also, the pilot will tend to make unintended inputs, in pitch and roll, across a 5.6 lb. "dead spot" in his or her perception. This can be especially vexing when the pilot is attempting to accomplish non-flying tasks, such as reading a chart, or dialing a radio frequency; he or she will apply an unknown and unintended input up to the limits of the JND.

A pilot flying in this manner is much more at risk of inducing an unintentional stall. Too many pilots are in the habit of flying the aircraft with large control pressures, far away from the trimmed angle-of-attack. The elevated JND makes it easy to accidentally apply the control forces necessary to overcome the stability of the aircraft and drive it to and past the critical angle of attack.

What can we do?

To avoid the unintentional stall, we need to develop the habit of flying the aircraft in trim and hands off. An airplane which is in trim and flown hands off is (with rare exception) impossible to stall. The natural (static) stability will drive it to and hold it at the trimmed (not stalling) angle of attack; flying hands-off ensures the pilot will not force the aircraft away from the trimmed (not stalling) condition.

Getting into a perfectly-trimmed condition is not always as easy as it sounds. For most pilots, it requires a change in the way we touch the controls. Due to the physiology, it is virtually impossible for pilots to trim an aircraft precisely if their hands are still on the yoke. Trimming, then, requires that we trim the aircraft to the limits of our perception (trim off the pressure), and then let go. Only with the hands off the yoke can we observe the change in pitch attitude and vertical speed which is the clue to the remaining out-of-trim condition which existed below our ability to perceive. Once observed, the change should prompt the pilot to pitch (with the

yoke, not the trim) back to the desired pitch attitude and rate of climb, trim slightly against the error, and try again. Only when the aircraft will stay at the desired pitch attitude and vertical speed for five to 10 seconds in hands-off flight can it be considered to be truly in trim.

Once in trim, the pilot should endeavor to avoid violating that trim. That is, "if it ain't broke, don't fix it." Said another way, the pilot should not touch the yoke unless there is presently an error in pitch that needs correction. If the airplane is doing what it should, there is no need to touch it!

All transitions in airspeed, power setting, and configuration will induce some trim change. Any change in the trimmed condition should be immediately addressed, so as to bring the aircraft back to the desired trim. Once the trim is regained, the trim should be maintained by flying hands off to the maximum possible extent.

It is important to realize that the oft-repeated advice "use a light grip" is, unfortunately, a misnomer. Another principle of physiology, the grab-and-grip reflex, makes this so. Under stress, the reflex induces us to unconsciously grab hold (of the yoke) and grip with increasing pressure. Over time, the light grip will invariably escalate to the famed white knuckles condition we see so often, and create all of the same problems as an out-of-trim condition. Thus, when a pilot does have to make a control input, it is important to avoid setting up a grip condition; it is better to touch the yoke, rather than to grip it. Use the minimum pressure required to achieve the desired correction, and then go back to hands off.

If you've developed the uneasy feeling that this methodology involves a radical change in the way we fly, you would be correct. It requires discipline, thought, and practice to achieve truly in-trim and hands-off flying skills but the rewards are worth it: better stall resistance, smoother ride for the passengers, more precise control of the aircraft, and lower pilot workload.

Try it.

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*Gene Hudson is an Assistant Chief Flight Instructor at Trade Winds Aviation at Reid-Hillview Airport, San Jose, Calif. He has been a flight instructor since 1987 and has logged over 17,000 hours in over 100 aircraft types.*


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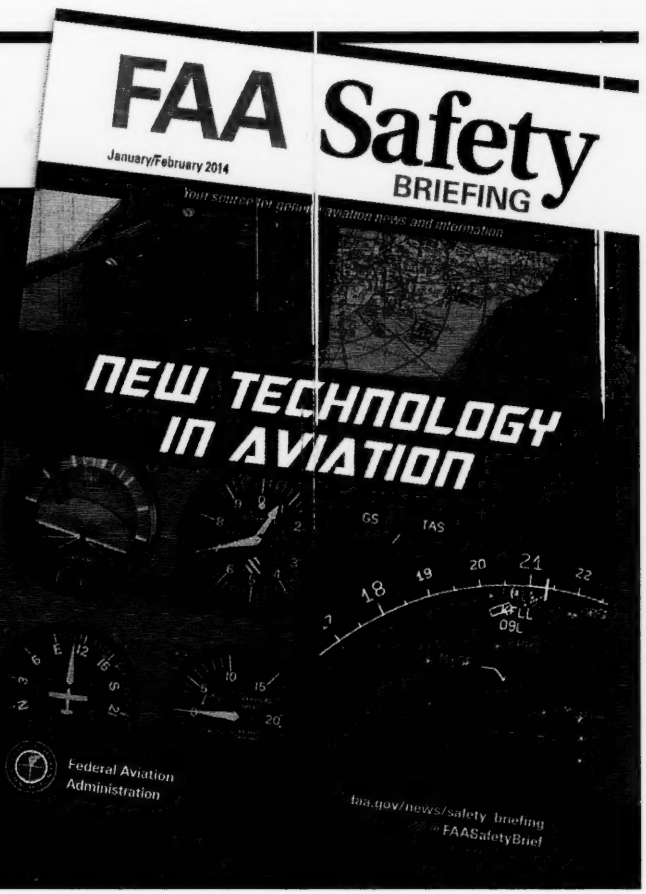


SUSAN PARSON

# Shifting Gears

## *Tips for Tackling Transition Training*

In the flight school where I worked as a part-time CFI some years ago, it was common to assign newly-certificated instructors to flights deemed less challenging than training for a certificate or rating. Intuitively, it makes sense. Rather than pairing a completely novice instructor with a completely novice trainee, the school would initially assign flight-seeing jaunts, introductory disco (discovery) flights, flight reviews, and rental checkouts to give new instructors an opportunity to get accustomed to the right-seat role.

Photo by H. Dean Chamberlain

And so it was that on one fine autumn day, I was on the schedule to conduct an aircraft rental checkout in one of the school's single-engine Cessna aircraft. The client was a genial, recently-retired airline pilot anxious to get back in the sky.

His credentials and qualifications were impressive — and more than a tad intimidating to a newbie like me. I couldn't imagine that I could possibly teach him anything about aviation, and it seemed arrogant to even try. As I reviewed his neatly-completed paperwork, I realized that I didn't even need all of the fingers on one hand to count the number of aircraft types I had flown. My client, on the other hand, didn't have enough room on the school's standard checkout sheet to list all of his. My total time was a very modest three-digit number. His was somewhere north of 20,000 hours. Sure, most of that flight time, and all of his most recent hours, were logged in heavy metal. Still, he and I both approached his single-engine Cessna checkout with more than a little of the "how-hard-can-it-be?" mentality.

You know where this story is going, right? The sight picture, speeds, and power settings that had become second-nature from his long airline career simply did not work in a light GA aircraft. Suffice it to say that he and I were both surprised and humbled by the experience. The first landing qualified as "great" only because we were both able to walk away from an airplane that could be flown again without a visit to maintenance.

## Up, Down, or Over?

As you might imagine, this early experience taught me several important lessons. The most important was to never, *ever* make assumptions on how previous training and experience might translate to a different aircraft.

Another lesson involves perspective. When we think about transition, pilots often focus more on what we perceive as moving "up" in the aircraft taxonomy. With more capable aircraft, we naturally expect to invest considerable time and effort to master the machine by understanding its avionics, its systems, its performance, and its handling characteristics.

Too often, though, we tend to give short shrift to the idea of moving "down" to an aircraft that appears deceptively simple to operate. Therein lies the trap. To assume that moving down is always going to be less demanding is every bit as inaccurate and dangerous as responding to the intuitive sense of "up and down" that can lead pilots to mishandle an aerodynamic stall. As Northrop test pilot Max Stanley famously noted:

> *The J3 Cub is the safest airplane in the world; it can just barely kill you.*

Any pilot who has transitioned from a standard category airplane to a light sport aircraft (LSA) will attest to the very real challenges involved in moving to a lower-performance airplane. In addition to being less capable in weather and possibly less robustly equipped, some LSAs have very different handling characteristics that can bite the unwary or ill-prepared pilot.

The bottom line is that whether moving to a more capable aircraft or to a simpler machine, every bird we fly deserves, and indeed demands, the utmost level of respect from its pilot. For that reason, we would do well to banish the notions of "up" and "down" when it comes to aircraft transition, except to the extent we focus on the correct way to make a particular aircraft properly go *up* on takeoff and smoothly come *down* again for landing. To establish a more appropriate mindset, think of it instead as moving *on* or *over* to a different aircraft.

**To assume that moving down is always less demanding is every bit as inaccurate — and dangerous — as responding to the intuitive sense of up and down that can lead pilots to mishandle an aerodynamic stall.**

## Transition Training Trifecta

Any kind of aircraft transition demands appropriate training. The specifics for such training are rigidly prescribed in the air carrier world, but what constitutes proper transition training for GA? Whether you are transitioning to a higher- or lower-performance aircraft, or even a different model, a sound transition training program should involve:

- *Structure*: Transition training should be conducted in accordance with a written training syllabus. Think of the syllabus as a checklist for training. As with an aircraft checklist, the syllabus provides a logical, systematic, and comprehensive approach to ensuring that you cover all the basics. It is also helpful to review the applicable practical test standards (PTS), which list the flight proficiency standards appropriate for the certificate and/or rating that the transitioning pilot holds.
- *Specifics*: Transition training is intended to teach the pilot what is different about

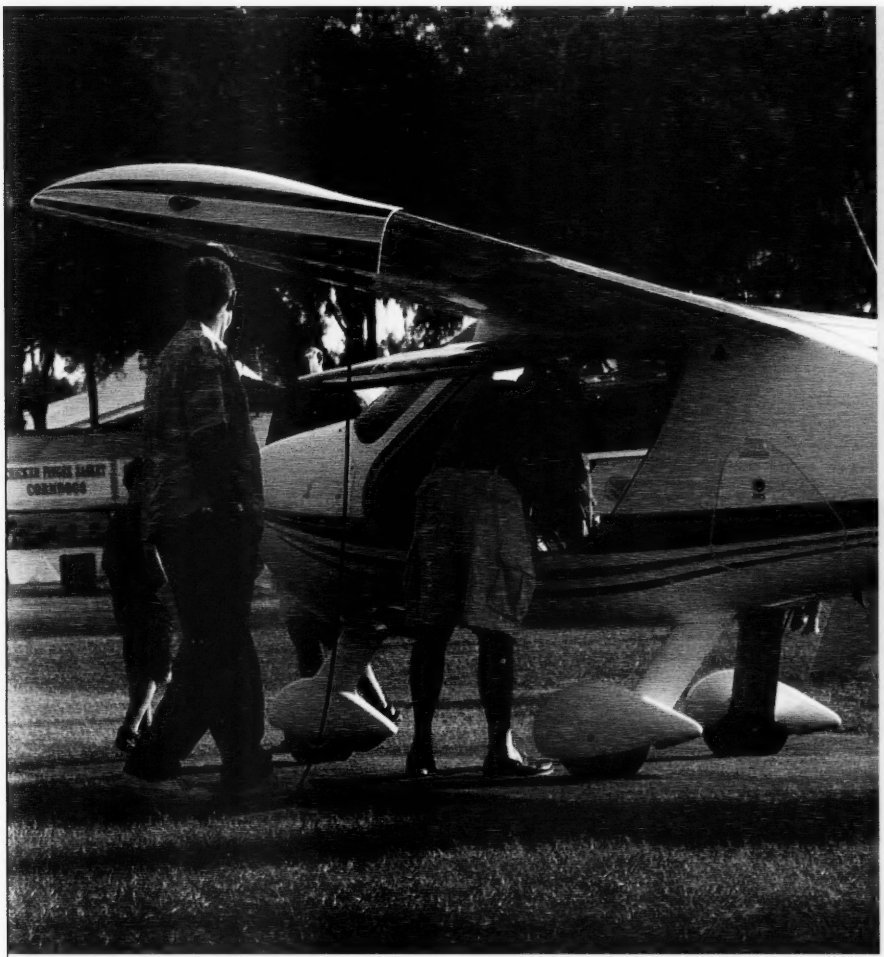


Photo by H. Dean Chamberlain

the aircraft or its installed equipment (e.g., avionics). The syllabus should thus address basic characteristics of the aircraft's systems (e.g., fuel, electrical, control, hydraulic, avionics, environmental, etc.), but with emphasis on how characteristics of the new aircraft differ from those in aircraft the pilot has already flown. It should cover normal, abnormal, and emergency procedures. The syllabus should also cover performance characteristics, including what to expect on takeoff and landing, climb, cruise, descent, and glide. Finally, it must address limitations, such as weight and balance, speeds, and kinds of operations (e.g., landing surfaces, maximum demonstrated crosswind component).

**Whether moving to a more capable aircraft or to a simpler machine, every bird we fly deserves, and indeed demands, the utmost level of respect from its pilot.**

- *Qualified Instructor*: To get the greatest benefit from your transition training, you need to hire an instructor who is current, qualified, and thoroughly knowledgeable about the airplane and/or equipment you want to master. The instructor should conduct your training in accordance with a comprehensive training syllabus. While it is important to cover all the material, a good instructor will have the ability to change the arrangement of the subject matter and/or shift the emphasis to fit the qualifications of the transitioning pilot, the characteristics of the aircraft or equipment involved, the circumstances of the training environment, and the goals of the transitioning pilot.

### What About Experimental?

If you are making the transition to an experimental airplane, you will find a great resource in FAA Advisory Circular 90-109, *Airmen Transition to Experimental or Unfamiliar Airplanes*. While not intended to address testing of newly-built experimental airplanes, AC 90-109 provides information and guidance to owners and pilots of experimental airplanes, as well as to flight instructors who teach in these airplanes. AC 90-109 provides recommendations for training experience in a variety of groupings based on performance and handling characteristics.

As the AC's introduction notes, pilots making the transition to any unfamiliar fixed-wing aircraft (including type-certificated airplanes) can also benefit from the information and guidance provided in this document, which includes tips on hazard identification and risk mitigation strategies.

Regardless of the nature of the transition, any pilot moving to an unfamiliar aircraft needs to use a transition training strategy appropriate to the airplane or equipment in question.

*Susan Parson (susan.parson@faa.gov, or @avi8rix for Twitter fans) is editor of* FAA Safety Briefing. *She is an active general aviation pilot and flight instructor.*

### Learn More

**Advisory Circular 90-109, *Airmen Transition to Experimental or Unfamiliar Airplanes***
www.faa.gov/documentLibrary/media/Advisory_Circular/90-109.pdf

**Airplane Flying Handbook (FAA-H-8083-3A), chapters 11 to 15**
www.faa.gov/regulations_policies/handbooks_manuals

SUSAN PARSON

# All Hands on Deck!

## *Managing the Mission with a Crew of Just You*

Like many GA pilots, I got very accustomed to being the sole pilot on board. Occasionally I flew with fellow pilots to maintain currency and proficiency, but most of my flying involved being alone in the airplane or serving as pilot *and* flight attendant to my non-aviator passengers. So I figured I was already pretty adept at "single pilot resource management" (SRM), a term that was just beginning to bubble into GA jargon.

Aviation never fails to deliver a powerful "not so fast" lesson anytime we pilots think we've got something nailed. My lesson in the real challenges of single-pilot operations came just after Thanksgiving about fifteen years ago. I had flown to coastal North Carolina to spend the holiday with family and, since the weather forecast for the return trip looked increasingly grim, I moved up my departure time by several hours.

I was in instrument meteorological conditions (IMC) shortly after takeoff, but I figured I'd soon be on top. In fact, I was in the soup for the entire two hour flight. I was counting on the IFR (vice low IFR) forecast at my destination to hold. However, I could tell from monitoring ATIS and automated weather observation system broadcasts along the way that this system was not behaving as the forecasters had expected. Thus it was not a complete surprise to hear an aircraft ahead report missing the approach to my airport. I knew things were about to get very busy for me, starting with the controller's almost immediate request for me to "say intentions." There was no copilot or autopilot to help with basic flying tasks while I sorted through charts and options. There was no GPS, except for the tiny first-generation handheld I had recently acquired. I had never flown any of the approaches to Dulles, which quickly became my only viable option. I had never flown a holding pattern "for real," but I had just copied instructions for holding in no-kidding IMC.

**SRM is the art of managing all the resources (both onboard the aircraft and from outside sources) available to a pilot prior to and during flight to ensure a successful flight.**

I was eventually cleared for the approach, which I flew with every bit of concentration and precision I could muster. I broke out of the clouds around 400 feet above ground level, and experienced that incredible sense of "there-it-is!" relief when I saw the brightly lit runway stretching out before me.

In the most basic terms, I passed the SRM test — I flew single-pilot, single-engine IFR in IMC and landed safely. In the broader sense, though, there was plenty of room for improvement.

### SRM Defined

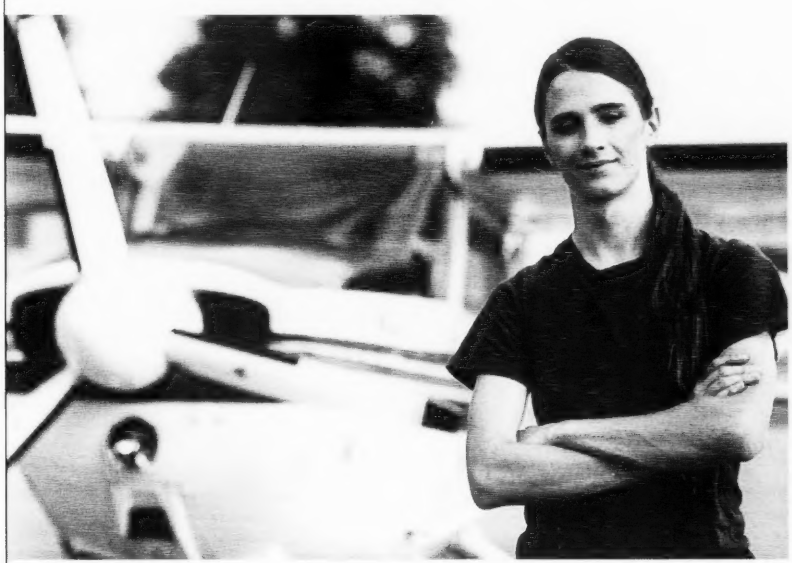
So what is single-pilot resource management? The FAA *Risk Management Handbook* (FAA-H-8083-2)

notes that SRM is defined as the art of managing all the resources (both onboard the aircraft and from outside sources) available to a pilot prior to and during flight to ensure a successful flight. It is about how to gather information, analyze it, and make decisions. It requires the pilot to competently perform a number of mental tasks in addition to the physical task of basic aircraft control. These include:

- Situational awareness
- Task management
- Automation management
- Risk management
- Aeronautical decision-making
- CFIT (controlled-flight-into-terrain) awareness

The *Risk Management Handbook* also offers an observation that became very real to me on my flight that day:

> *Learning how to identify problems, analyze the information, and make informed and timely decisions is not as straightforward as the training involved in learning specific maneuvers. Learning how to judge a situation and "how to think" in the endless variety of situations encountered while flying out in the "real world" is more difficult. There is no one right answer in ADM; rather each pilot is expected to analyze each situation in light of experience level, personal minimums, and current physical and mental readiness level, and make his or her own decision.*



That is no small challenge, especially for GA pilots whose aeronautical experience may be limited. In the case of my flight, the strong instrument maneuvers and procedures training I had received provided the solid foundation necessary for task management and situational awareness, especially in an airplane with no automation (thus no need for automation management). What I most clearly lacked was a practical framework for risk management and aeronautical decision-making.

### SRM in Action

The incorporation of SRM into GA pilot training curricula is an important step forward in aviation safety. A structured approach to SRM helps pilots learn to gather information, analyze it, and make decisions on the conduct of the flight.

When it comes to gathering information, SRM training emphasizes that even though the flight is operated by an individual pilot and not an onboard crew, the pilot has a number of inside and outside resources available to assist with the flight. A key skill is to identify and effectively use these resources for the safe conduct of the flight.

For example, internal resources might include passengers, even if they have no flying experience. The pilot can ask passengers to assist by reading checklist items and watching for traffic. Passengers can also help listen for air traffic control (ATC) radio calls and the pilot can also teach the right seat passenger to assist with functions such as switching radio frequencies. It could also be helpful to teach frequent passengers some basic programming skills for moving map and multifunction displays, if the aircraft is so equipped. Internal resources might also include the pilot's use of verbal briefings. Many solo pilots read the checklist — an essential internal resource! — out loud, and make it a point to touch the appropriate switch or control.

Your onboard equipment, which can include both panel-mounted and hand-held devices, constitutes another important internal resource. Today's technology offers an incredible range of information to assist with overall situational awareness, navigation, weather information, and much more. The key to benefiting from this resource is to know your devices: long before you leave the ground, know what information is available and make sure you know how to access it without unduly diverting your attention from essential aircraft control duties.

External resources include ATC and Flight Service (AFSS). ATC can assist with traffic advisories,

radar vectors, flight following, and assistance in emergency situations. A pilot with a problem can request assistance from ATC. Services provided by ATC can not only decrease pilot workload, but also help pilots make informed inflight decisions. Flight Service and Flight Watch can assist with inflight weather information.

Fellow pilots are another potential external resource. These include air carrier crews, flight instructors, corporate flight crews, or any other pilot in your vicinity. Aviators on or near your route of flight can often provide the most useful real-time information about weather and general flight conditions.

To get the greatest benefit from SRM, you also need a practical framework for application in day-to-day flying. As outlined in the *Risk Management Handbook*, one such approach involves regular evaluation of:

- Plan
- Plane
- Pilot
- Passengers
- Programming

The point of the 5P approach is not to memorize yet another aviation acronym. You might simply write these words on your kneeboard, or add a reference to 5Ps to your checklist for key decision points during the flight. These include preflight, pre-takeoff, cruise, pre-descent, and just prior to the final approach fix or, for VFR operations, just prior to entering the traffic pattern.

Items to consider in association with the 5Ps might include the following.

*Plan:* The plan includes the basic elements of cross-country planning: weather, route, fuel, current publications, etc. The plan also includes all the events that surround the flight and allow the pilot to accomplish the mission. The pilot should review and update the plan at regular intervals in the flight, bearing in mind that any of the factors in the original plan can change at any time.

*Plane:* The plane includes the airframe, systems, and equipment, including avionics. The pilot should be proficient in the use of all installed equipment, as well as familiar with the aircraft/equipment's performance characteristics and limitations. As the flight proceeds, the pilot should monitor the aircraft's systems and instruments in order to detect any abnormal indications at the earliest opportunity.

*Pilot:* The pilot needs to pass the traditional "IMSAFE" checklist. This part of the 5P process helps a pilot identify and mitigate physiological hazards at all stages of the flight.

*Passengers:* The passengers can be a great help to the pilot by performing tasks such as those listed earlier. However, passenger needs — e.g., physiological discomfort, anxiety about the flight, or desire to reach the destination — can create potentially dangerous distractions. If the passenger is a pilot, it is also important to establish who is doing what. The 5P approach reminds the pilot-in-command to consider and account for these factors.

*Programming:* The programming can refer to both panel-mount and hand-held equipment. Today's electronic instrument displays, moving map navigators, and autopilots can reduce pilot workload and increase pilot situational awareness. However, the task of programming or operating both installed and handheld equipment (e.g., tablets) can create a serious distraction from other flight duties. This part of the 5P approach reminds the pilot to mitigate this risk by having a thorough understanding of the equipment long before takeoff, and by planning in advance when and where the programming for approaches, route changes, and airport information gathering should be accomplished, as well as times it should not be attempted.

**A structured approach to SRM helps pilots learn to gather information, analyze it, and make decisions on the conduct of the flight.**

Whatever SRM approach you choose, use it consistently and remember that solid SRM skills can significantly enhance the safety of "crew of you" flights.

*Susan Parson (susan.parson@faa.gov, or @avi8rix for Twitter fans) is editor of* FAA Safety Briefing. *She is an active general aviation pilot and flight instructor.*

### Learn More

**FAA's Risk Management Handbook (FAA-H-8083-2), chapter 6**
www.faa.gov/regulations_policies/handbooks_manuals/aviation/risk_management_handbook/

**Advisory Circular 120-51E, *Crew Resource Management Training***
http://go.usa.gov/ZECw

**"Whither and Whether of Flying in Weather" (*FAA Safety Briefing* – July/August 2010)**
www.faa.gov/news/safety_briefing/2010/media/julaug2010.pdf

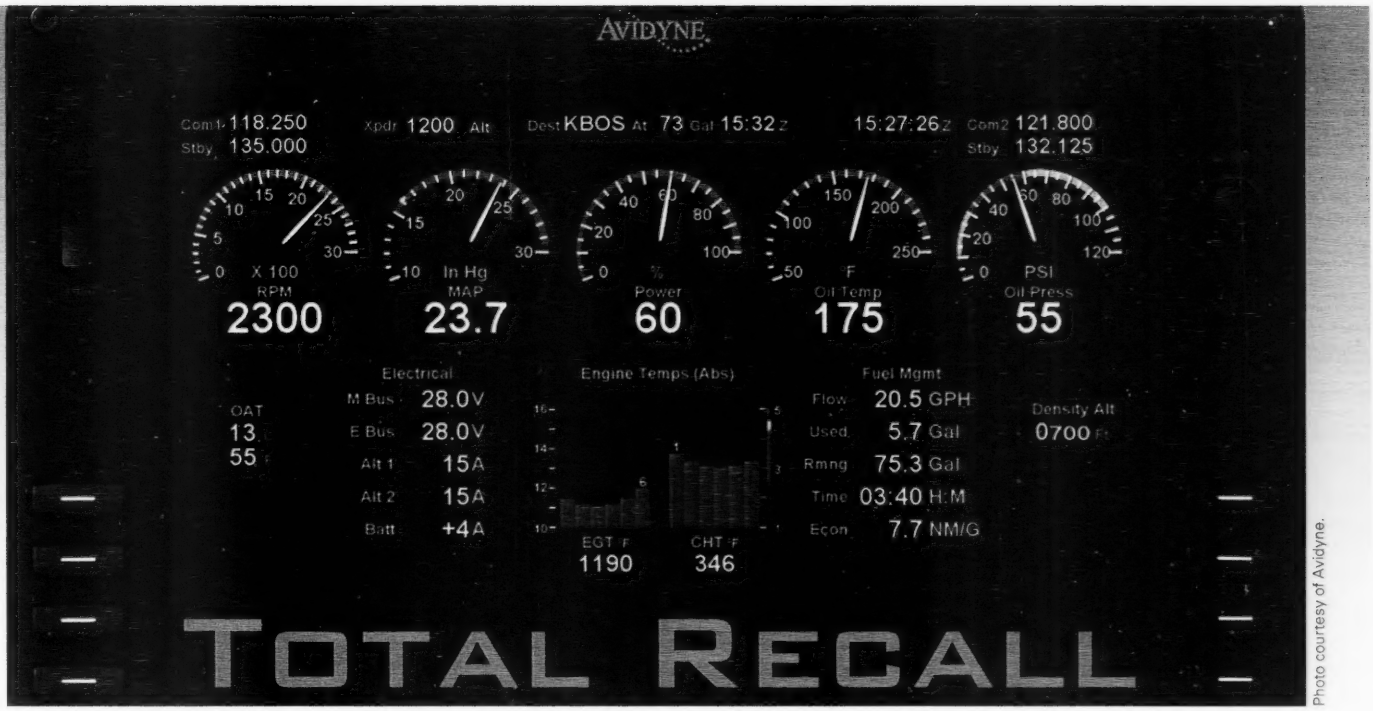



Photo courtesy of Avidyne.

# How Flight Data Monitoring Can Help Improve Your Skills

JAMES WILLIAMS

What separates the very good from the truly great is recall.

This concept might initially strike you as an odd idea. You might think; isn't talent a factor in distinguishing the good from the great? Talent certainly plays a role, but greatness demands more. It demands a sort of "extra capacity" that can only be described as recall.

Nowhere is this concept clearer than in Formula One (F1) racing. An average driver might be able to tell you what his or her car was doing and how it felt overall on a particular circuit. A good driver might be able to tell you how it reacted in particular corners on that circuit. But the great F1 drivers can tell you about virtually any point on that circuit: what gear they were in, what the speed was on corner entry, what the water temperature was, what the differential setting was, and much more. In a world where hundredths or even thousandths of a second can mean the difference between first and tenth, the devil is truly in the details. Vivid and detailed recall thus allows the racing team and driver to better set up the car for a circuit.

**FDM data allows both you and the computer to monitor information in real time and review it more carefully after the fact.**

So what does this mean for pilots?

One of the benefits of so-called glass cockpit avionics is that a tremendous amount of the information we generate — and need for our "total recall" flight management efforts — can be digitally captured and recorded. While we aren't generally transmitting this information from the aircraft "on the fly" like F1 drivers do on a race course, Flight Data Monitoring (FDM) systems do make it infinitely easier to collect.

In the days of nothing-but-analog instruments, information was passed from a sensor such as a tachometer or a pitot tube, to a gauge. In most cases, these gauges provide the instantaneous state of whatever it is measuring. The "instantaneous" nature of the data isn't as important as the trend, so that's why it's important to continuously monitor systems. That's also where digital records are handy: the digital record allows both you and the computer to monitor information in real time and review it more carefully after the fact.

The FDM dataset can include anything from a simple smartphone-generated flight track to a complete avionics record that provides everything from engine parameters to control surface deflections. Airlines have long used this kind of information in a program called Flight Operations Quality Assurance (FOQA). In essence, air carriers use the data collected in the Digital Flight Data Recorder (DFDR) or Quick Access Recorder (QAR) to review fleet-wide trends and develop system-wide mitigations for issues they've identified as possible incident/accident precursors, or practices that detract from operational efficiency.

GA aircraft don't use DFDR or QAR recorders, but many modern avionics systems can offer some-

thing pretty close for our purposes. This capability can be really useful both for piloting and for monitoring the health and well-being of your aircraft. Here's how.

To understand how "flight telemetry" can be useful in improving pilot skills, it's helpful to see how such information is used elsewhere — for example, in F1 racing. Through simulation, F1 teams come up with a "perfect" lap for any given circuit. Next, they compare the telemetry data to the simulation to see where and how they might be able to improve.

Pilots can adapt this technique by using online programs, apps, and tools that allow you to overlay your personal flight data on a sectional, instrument, or approach chart. This technique provides a clear picture of how precisely you flew the planned track, or how well you tracked the localizer and/or glideslope on an instrument approach. It also lets you see how well you did during the en route phased with such "mundane" (but important!) tasks as holding altitude or heading, following noise abatement procedures, proficiency work (e.g., stall recovery practice), or flying a proper traffic pattern. By comparing your actual performance with the ideal values depicted on the chart or flight plan, you can pinpoint specific areas for improvement in your practice sessions, both with and without an instructor.

Speaking of instructors, this kind of flight data information can be an excellent tool for instructors. The CFI can use FDM readouts to make debriefs more interactive and more accurate, as well as to identify areas for additional explanation, practice, or emphasis. And, finally, for those who benefit from a bit of friendly competition, FDM data can provide an indisputable basis for "best pattern" (or "best" whatever) bragging rights.

As noted, FDM can also provide extremely helpful data on the health and well-being of your aircraft. As with human health, early detection is key to avoiding big health problems down the road. When it comes to communicating about illness or potential illness, though, non-FDM-equipped aircraft are even less communicative than the typical household pet. Sure, they can give warning signs to the watchful pilot, but too often the troubleshooting process involves expensive guesswork. With FDM, though, you get tons of useful information. You can see what every parameter is doing, and see how it compares with other parameters throughout the flight. You can analyze the meaning of the various readings and trends, and plot key parameters in a time series over multiple flights or years. This kind of information can save you a lot of money, and it can give your AMT a head start on identifying and fixing the real issue. Less trial-and-error translates pretty quickly to lower shop bills.

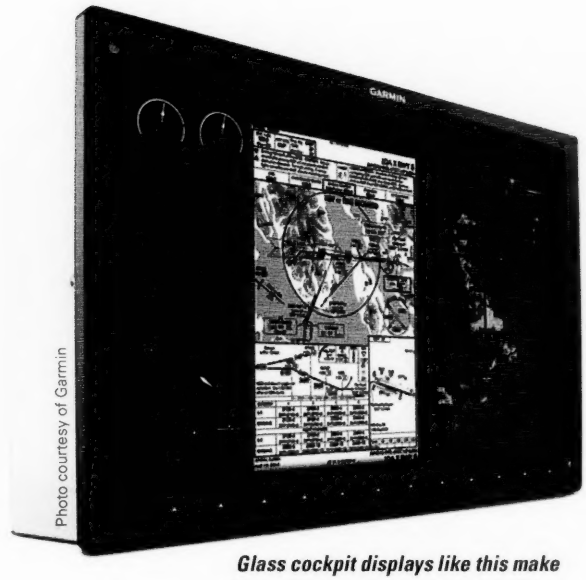


Photo courtesy of Garmin

***Glass cockpit displays like this make data collection and analysis far easier.***

Our own in-house amateur-built aircraft expert, Aviation Safety Inspector Mark Giron, raves about the benefits of FDM for his own aircraft. "On my RV-6, I take data from my avionics and upload it into a free service on the web," Giron explains. "The service puts it into usable graphs that let me sort and plot the data in various ways. That lets me see how selected metrics react to each other."

**By using FDM data to compare actual performance with ideal values depicted on the chart, you can pinpoint specific areas for improvement in your practice sessions.**

Giron also has a ready example of how FDM helped with troubleshooting. "At one point, my engine was getting uneven cooling. I used the data to test some revised inlet designs that solved the problem. I wouldn't have known about the issue, much less have been able to fix it, without FDM."

Here's the bottom line: Information is a powerful tool. As one F1 team boss once said, "It is impossible to *not* learn something about your car by running it with telemetry." The same goes for aviation: FDM "telemetry" can help you identify ways to be a better pilot, and show you ways to improve the mechanical condition of your airplane. Use it!

*James Williams is FAA Safety Briefing's assistant editor and photo editor. He is also a pilot and ground instructor.*

BOB MAYNARD

# Watch Out

## What's Your True Altitude?

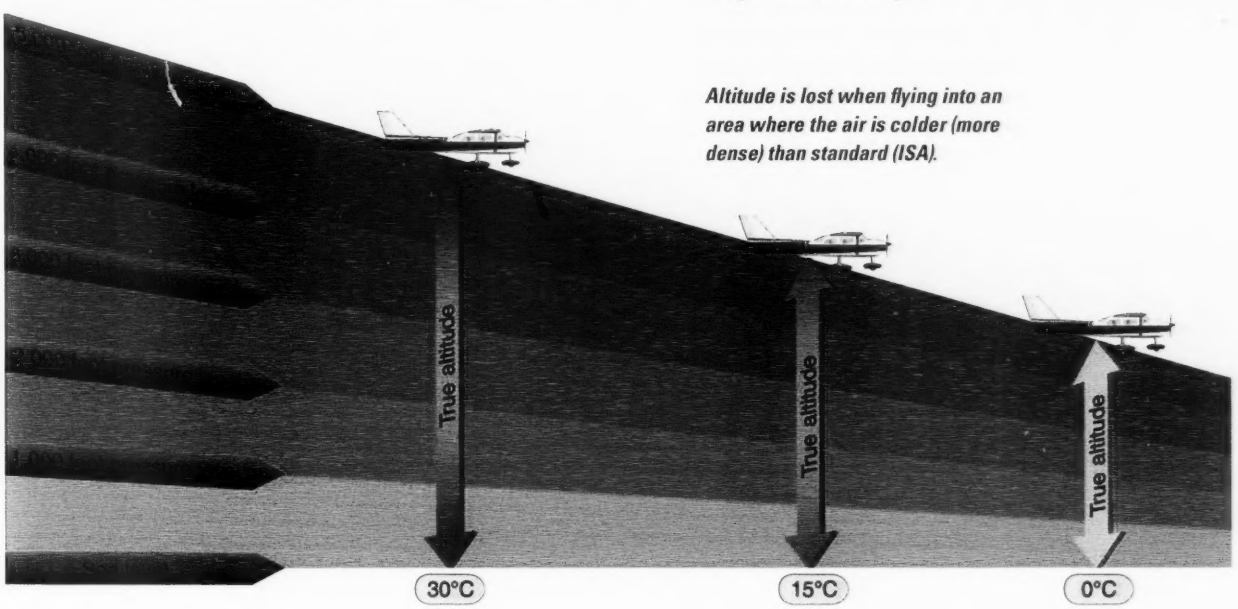
# Below

Although this issue of *FAA Safety Briefing* bridges winter and the (hopefully) warmer days of spring, it's not uncommon for Mother Nature to retain her icy grip a bit longer than we'd like. Consequently, there's a long list of unique issues that should be considered before attempting any cold-weather flying. Some of the more obvious issues include runway contamination, icing conditions, strong winds aloft, fuel contamination from condensation, and the effects of extreme cold on aircraft instruments and engines. One of the more elusive issues, however, is underestimating the often hazardous difference between indicated altitude and true altitude.

A barometric altimeter only indicates correctly when the temperature is standard, which is commonly known as international standard atmosphere (ISA). ISA is 15 degrees Celsius (59 degrees Fahrenheit) at sea-level by international standards. Temperature decreases by approximately 2 degrees per 1,000 feet of altitude. At a sea-level airport, the only time that indicated altitude is equal to true altitude is when the surface temperature is 15 C. Anything lower than that temperature, your aircraft will be lower than indicated. Anything higher will result in your true altitude being higher than indicated. This can be seen from the illustration below.

### Error, Error

In extremely cold conditions, the difference between indicated altitude and true altitude can be significant. The table on the right shows the possible altimeter errors based on the temperature and height above an airport.




***Altitude is lost when flying into an area where the air is colder (more dense) than standard (ISA).***

| Reported Temp °C | Height Above Airport in Feet | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 200 | 300 | 400 | 500 | 600 | 700 | 800 | 900 | 1,000 | 1,500 | 2,000 | 3,000 | 4,000 | 5,000 |
| +10 | 10 | 10 | 10 | 10 | 20 | 20 | 20 | 20 | 20 | 30 | 40 | 60 | 80 | 90 |
| 0 | 20 | 20 | 30 | 30 | 40 | 40 | 50 | 50 | 60 | 90 | 120 | 170 | 230 | 280 |
| -10 | 20 | 30 | 40 | 50 | 60 | 70 | 80 | 90 | 100 | 150 | 200 | 290 | 390 | 490 |
| -20 | 30 | 50 | 60 | 70 | 90 | 100 | 120 | 130 | 140 | 210 | 280 | 420 | 570 | 710 |
| -30 | 40 | 60 | 80 | 100 | 120 | 130 | 150 | 170 | 190 | 280 | 380 | 570 | 760 | 950 |
| -40 | 50 | 80 | 100 | 120 | 150 | 170 | 190 | 220 | 240 | 360 | 480 | 720 | 970 | 1,210 |
| -50 | 60 | 90 | 120 | 150 | 180 | 210 | 240 | 270 | 300 | 450 | 590 | 890 | 1,190 | 1,500 |

*ICAO Cold Temperature Error Table*

## Adjusting the Math

The adjustments for temperature compensation are currently handled by air traffic control (ATC) by changing the aircraft's minimum vectoring altitude. For example, at a cold-climate airport in the summer, ATC might vector you to the final approach course for an instrument approach at 1,500 feet mean sea level (MSL), whereas in the winter, they will most likely vector you to the final approach course at 2,000 feet MSL. This ensures that you will have adequate terrain clearance while being vectored to an instrument approach in very cold conditions. Some flight crews go one step further and intentionally adjust the decision altitude (DA) or minimum descent altitude (MDA) utilizing the error table to ensure adequate obstacle clearance at DA or MDA.

For a sea-level airport on a day when the temperature is -30 C with a "200-½" (200 feet above the ground and a half mile visibility) instrument landing system (ILS) approach, the adjustment made to the DA would be to add 40 feet to the published DA. Therefore the decision to go around would be made when the barometric altimeter reading is at 240 feet instead of 200 feet. The effect of this adjustment is that the missed approach would actually be made at 200 feet true altitude — as the FAA intended — as opposed to a pilot making no adjustment and actually initiating the missed approach at 160 feet true altitude.

The ILS system has worked well for years since the geometry of the ILS radio signal is unaffected by temperature. A three-degree ILS glideslope will always be a three-degree vertical path regardless of the temperature.

## Approach with Caution

The *Aeronautical Information Manual* (AIM) states: "When operating in extreme cold temperatures, pilots may wish to compensate for the reduction in terrain clearance by adding a cold temperature correction." Unfortunately, with the introduction of barometric vertical navigation (baro-VNAV) GPS approaches, simultaneous updating of the temperature compensation procedures did not happen.

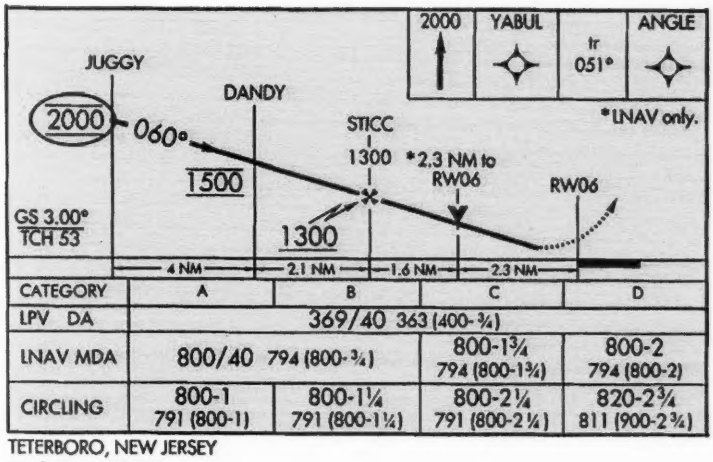
Many of the flight management systems connect theoretical points in space without regard to temperature, which means that as the temperature gets lower, the vertical path gets more and more shallow. In fact, the reason for the minimum temperature restriction on most of the baro-VNAV approaches is to limit the shallowness of the vertical path angle. The only way to correct that path angle using baro-VNAV is to recalculate the crossing altitudes using the correct temperature compensation. This way, your aircraft will cross the final approach fix (FAF) at the correct true altitude, and the vertical path will once again be the angle that the FAA intended.

**A pilot has no authority to cross the final approach fix below the published minimum crossing altitude, which means temperature compensation for ISA plus conditions is not allowed at this time.**

There is no specific FAA guidance defining how to notify ATC of the pilot's intent to use temperature compensation or whether a pilot is authorized to use temperature compensation after being given a specific ATC clearance.

With the ability of the newer aircraft to automatically temperature compensate, altitude adjustments are becoming an increasingly sticky issue. The newest Honeywell flight management software allows a temperature compensation selection prior to approach that will automatically recalculate all of the intermediate crossing altitudes on the approach. This issue will require further FAA guidance before these types of conflicts become more and more commonplace.

If you are fortunate enough to have a Wide Area Augmentation System (WAAS) equipped GPS on your aircraft and have the ability to conduct local-




TETERBORO, NEW JERSEY
Amdt 2B 17OCT13

***Be aware of temperature compensation communication between you and ATC. In this example, you have been cleared for the instrument approach shown here and expected to cross JUGGY at 2,000 feet. If the temperature that day is -30 C, the corrected altitude should be 2,380 feet according to the temperature error table. However, there are two problems with attempting this temperature correction. First, the approach chart clearly states that you are to cross at only 2,000 feet, not at-or-above. Second, with Newark departing to the north, Newark approach will probably not be happy with the lack of clearance that you have created between your aircraft and the departing Newark traffic.***

izer performance with vertical guidance (LPV) approaches, the portion of the approach where the LPV vertical path is captured is fixed because the vertical path is based upon geometric altitude and not baro-VNAV. This still leaves the pilot responsible to correct for the DA, and it still does not resolve the issue of crossing altitudes of the intermediate and final approach fixes prior to intercepting the LPV final approach path. It is still up to the pilot to adjust for those segments of the approach.

### Know the Variables

As you have noticed, there are also maximum temperature limits on many of the baro-VNAV approaches. Those limits are to prevent a path that is too steep. Theoretically you could temperature compensate for ISA within the allowed limits on the approach chart, but this presents an additional problem. On a day when the temperature is ISA plus 30 degrees, you might be tempted to compensate in the opposite direction to ensure that you would cross the FAF in the first example of the sea level ILS at 1,200 feet indicated altitude rather than the published altitude of 1,500 feet. That would put you at a true altitude of 1,500 feet as the FAA intended. However, you have no authority to cross the FAF below the published minimum crossing altitude, which means temperature compensation for ISA plus conditions is not allowed at this time.

With the very limited guidance on temperature compensation, you must be very careful if you attempt to use these procedures. At a minimum you must ensure the following:

1. Communicate with ATC and obtain permission to use temperature compensation on all segments of the approach (the DA or MDA may be adjusted without coordination).
2. Keep a copy of the ICAO Cold Temperature Error Table readily available so you can verify the calculations.
3. Thoroughly review the approach chart to ensure that you do not violate any crossing restrictions such as cross-at altitudes.
4. If your aircraft has automated temperature compensation within the navigation computer, ensure you are properly trained to use that feature.
5. Include the radar altimeter in your pilot/crew scan as a backup for any errors that might occur during temperature compensation calculations.
6. Always respect the ground proximity warning systems, and take immediate corrective action in the case of an alert or warning.

Cold weather flying can be very challenging. This particular aspect of navigation adds more variables and deserves the same scrutiny and pilot knowledge that de-icing or stopping distances pose. With proper training and coordination with ATC, temperature compensation calculations can be accomplished safely.

*Bob Maynard is the fleet training program manager for the Gulfstream GV, G450, G550, and G650 certificate management unit at the Wichita Flight Standards District Office. He has served as an FAA aviation safety inspector since 1991.*

### Learn More

**Instrument Flying Handbook, chapter 5**
http://1.usa.gov/1gEbJfb

**Aeronautical Information Manual (AIM), chapter 7**
http://1.usa.gov/1a96lqq

# Checklist

SUSAN PARSON

## Stall? Who, Me?

Like many student pilots, I really, *really* hated, practicing stalls. Notwithstanding my patient CFI's attempts to explain, I didn't understand why it was necessary to do such things. As I suffered through this phase of instructor-inflicted torture — which is exactly how I saw it — I was darkly muttering about how I would never put myself in the position of stalling (much less spinning) the airplane. Yeah, sure, I could parrot the mantra on how it's possible to stall an airplane at any airspeed and in any flight attitude, but the only stalls I saw (or practiced) were the ones involving very low airspeed and high angle of attack. Not me!

Fast forward a few years. I was piloting my club's Cessna 182 in the traffic pattern at my home airport. The airplane was heavier because I had two passengers aboard. The winds were westerly, which gave me a tailwind on base and a much faster ground speed than I had anticipated. I overshot the base-to-final turn. Yes, I had been taught to go around. But I thought I could make it work. I had been trained to avoid steep turns in the pattern, so I didn't go much beyond a 30-degree bank. Since that clearly wasn't enough to correct my overshoot, I unconsciously applied "bottom" rudder to slew the nose around to the runway heading.

Bad move.

Fortunately for my passengers, my airplane, and me, the stall horn did its job. That high-pitched beeeeeeeeeeeep that I had previously heard only in training yanked my brain away from its single-minded intent to make this landing work, and cued up the well-drilled stall recovery procedure that my instructor had made me practice so much. I executed the go-around I should have done to begin with, and even made a pretty decent landing on the second attempt. I was shaken, though, to realize that I could have become a maneuvering flight statistic.

The silver lining is that my mistake provided strong incentive to delve more deeply into aerodynamics and causes of loss of control (LOC). Sadly, I'm not the only pilot who needs this review. A study by the FAA/industry General Aviation Joint Steering Committee last year showed that loss of control inflight (LOC-I) fatal accidents occur at almost three times the rate of the second leading cause; controlled flight into terrain. As my near-statistical experience showed me, being able to accurately recite words from the textbook did not mean that I had a practical understanding of how, or why, they translate in real-world flying. Because I learned so much from my brush with LOC-I, I now consider it one of the most important events in my aviation education.

There are, of course, easier and far safer ways to learn these lessons. One learning tool that can benefit all pilots — and especially anyone just getting back into the flying game — is a paper recently released by the Society of Aviation and Flight Educators (SAFE). The paper, titled *Maintaining Aircraft Control*, is available free to the public in the SAFE Resource Center (www.safe.org). Authored by experts including Rich Stowell, Randy Brooks, Jeff Edwards, Janeen Kochan, and Paul Ransbury, the paper discusses fatal GA upsets attributable to pilots, the flight environment, weather, aircraft system anomalies, and operations that take the aircraft outside its design limitations. A special section explains the difference between upset prevention and recovery training, and traditional aerobatics. Much of the paper will also be included in the forthcoming revision of the FAA's *Airplane Flying Handbook*.

The paper attributes many LOC-I accidents to lack of pilot proficiency. It also suggests that the GA culture does not typically provide sufficient LOC-I avoidance guidance or emphasis on continued pilot education and training.

As Stowell notes, "It takes ongoing practice and refinement to maintain the skills needed to be a safe, competent pilot." And, as I can personally attest, it's definitely an effort worth making.

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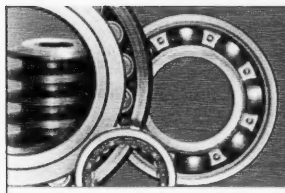
*Susan Parson (susan.parson@faa.gov, or @avi8rix for Twitter fans) is editor of* FAA Safety Briefing. *She is an active general aviation pilot and flight instructor.*





SABRINA WOODS

# Transitional Maintenance

By now you have read a bit about getting back in the game; transitioning from the harsher winter weather and emerging to the spring ready for flight. There are so many things to consider — from regaining currency to brushing up on resource management and wildlife avoidance techniques. From an aviation maintenance point of view, this can be a two-part process.

### Man and Machine: Two Halves of the Same Coin

First up is focusing on "the man." In previous editions of *FAA Safety Briefing* we have discussed the importance of ensuring maintenance integrity by never taking on more than you can handle or jobs that are beyond your understanding. There is no shame in admitting that something is new to you. In fact, the springtime transition provides the perfect opportunity to brush up on your proficiencies and as such, the FAA Safety (FAAST) Team has some great courses to help you on your way. Found here, go.usa.gov/Z8Jj, the website lists core and refresher courses hosted by different agencies. Need to brush up on lubrication points for specific engines? The site has that. Feeling a bit shaky on modern borescope tactics? There is a course for that, too. A highlight course that is now being offered is titled Maintenance Error Avoidance and it can be found here: go.usa.gov/ZvhG.

This is also a great time to reaffirm your own personal minimums and to create checklists reflecting your choices. Some things to consider adding to your list include inspecting yourself (any new ailments?), your shop (are supplies adequate/calibrated/clean?), and publications (are they up to date?).

The other half of the coin is "the machine." Whether the aircraft has been moth-balled during the winter or if it routinely flew will make a difference in what kind of inspections should occur during "spring cleaning."

If the aircraft has been stored, a good once-over will ensure items are properly lubricated, critters are evicted, corrosion issues are addressed, and routine battery maintenance is done. It is a great time to accomplish an annual so you can be reassured the aircraft is able to meet the demands of logging long summertime hours. Even if you don't schedule a formal inspection, spring transition is the right time for you to take a closer look at every aspect of the aircraft and get reacquainted. To learn more about basic inspection techniques, check out FAA's *Inspection Fundamentals* handbook (go.usa.gov/ZZ9Y). It's also a good idea to give your plane a good wash down, vacuum, and polish because if you are anything like most of my buddies, you did *none* of this before winter bed down.

If the aircraft has been flying during the icier times of the year, springtime once-overs should include a check for frozen precipitation-inflicted structural damage. In addition, a thorough cleaning will get rid of deicing residues, salt build-up, mud, and those personal effects (i.e., the pile of empty coffee cups) you have "stored" in the back.

In both cases, you should always confirm that any existing or recent safety bulletins, airworthiness directives, and/or advisory circulars pertaining to your aircraft have been addressed prior to partaking in the new flying season.

### Snakes on a Plane

Although mentioned with humor earlier, in seriousness, wildlife damage isn't just relegated to bird or mammal strikes. Rodents, birds, reptiles, and insects are resourceful and can be prolific. When you button your aircraft up for the winter, these opportunistic animals can move in and wreak havoc on your sensitive wiring, create fire hazards, destroy insulation, and I have personal experience of what happens when a very large swarm of bees develops a "taste" for hydraulic fluid and decides to move the colony in. In addition, the droppings of these pests are often highly corrosive and that can damage the structural integrity of your plane as well as ruin a great paint job. They are also a hazard to your personal health, so keep 'em out!

Warmer temps mean more flying opportunities. With a little bit of attention to "transitional maintenance," both the man and the machine will be ready to take to the skies.

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*Sabrina Woods is an assistant editor for* FAA Safety Briefing. *She spent 12 years in the active duty Air Force where she served as an aircraft maintenance officer and an aviation mishap investigator.*

TOM HOFFMANN

# Fear the Unknown

## *How a Well-Planned Test Flight Can Prevent Any Unwanted Surprises*

It's been a labor of love for 10 years; one that has pretty much taken over your garage (and maybe most of your basement) with a growing assortment of tools, hardware, and empty coffee cups as far as the eye can see. As you put the finishing touches on your new experimental amateur-built (E-AB) aircraft, you envision the tremendous joy you'll get from flying this bird, a product of your own blood, sweat, and, well, after seeing how empty your wallet has become, there's bound to have been a few tears!

But before you and your new flying machine take to the skies, there are still a few important questions to consider. How do you know your aircraft is in a condition for safe flight? Will it operate safely within its operational envelope? Will it have any quirky characteristics or design limitations? To find out, you'll need to develop a detailed flight test plan.

Thankfully the FAA has produced an excellent document that can help you develop such a flight test plan, taking into account everything from selecting the right airport and runway to an exhaustive list of first flight and emergency procedures. It is Advisory Circular (AC) 90-89, *Amateur-Built Aircraft and Ultralight Flight Testing Handbook*, and it can be accessed by clicking the Advisory Circular link under the Regulations and Guidelines tab on www.faa.gov.

In addition to providing recommendations and suggestions to assist in developing an individualized aircraft flight test plan, this AC also stresses the critical nature of test flying to amateur-built/ultralight aircraft pilots. According to the AC, "the flight test plan is the heart of all professional flight testing." It also states that "the plan should account for every hour spent in the flight test phase and should be adhered to with the same respect for the unknown that all successful test pilots share."

While you might be chomping at the bit to get your new baby airborne, it's important to heed the advice this AC offers in terms of flight test preparation. In addition to discovering any unwanted characteristics (e.g., perhaps you rigged the aileron cables too tightly), a thorough flight test plan will also help point out performance limitations you may not be used to with your previous aircraft type. For example, those transitioning to an ultralight will notice a big difference in how power settings can affect airspeed. In a light-weight aircraft, it is possible to go from cruise speed to a stall in less than 4 seconds. This is due to the low mass, high drag configuration, and smaller speed range characteristic of the majority of ultralights.

Another question to consider before you make that first flight in an E-AB airplane is how much time and experience you have in this type of aircraft. According to a 2011 National Transportation Safety Board (NTSB) study, 10 of 102 E-AB aircraft accidents involving aircraft built by their owner crashed on their first flight that year. Those buying used aircraft didn't fare much better: 14 of 125 EAB accidents in used aircraft involved first flight crashes as well. These numbers clearly underscore the need for better transition training methods, especially if you're unfamiliar with the aircraft's systems and operations.

So, before you formulate your flight test game plan with AC 90-89, be sure to also review AC 90-109, *Airmen Transition to Experimental or Unfamiliar Airplanes*, to help you develop the skills and knowledge you'll need *before* you participate in a flight test program. Incidentally, the AC is also useful when planning a transition to any unfamiliar fixed-wing airplanes, including type-certificated airplanes. Also noteworthy is the fact that this AC was developed in a true collaborative fashion under the direction of the General Aviation Joint Steering Committee, a joint panel of FAA and aviation industry experts.

"The keys to safely and successfully flying your aircraft for the first time are a detailed flight test plan, knowing what to expect in flight, and having a great support team of advisors on the ground," says Aviation Safety Inspector Mark Giron with the FAA's General Aviation and Commercial Division. "Practicing the information in these ACs goes a long way in mitigating risks associated with your first flight in any aircraft."

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*Tom Hoffmann is the managing editor of the* FAA Safety Briefing. *He is a commercial pilot and holds an A&P certificate*

RORY RIEGER

# Hang in There

Times are hard. The Great Recession lingers. The aviation industry has been hit particularly hard. This is no surprise. Downturns in the economy almost always lead to a drop in aviation employment. When markets tank, company jets get the ax. Business folks curtail travel. Family vacations become staycations.

The good news is that a new boom is about to take off. New aircraft orders are making headlines. In the meantime, pilots must maintain proficiency. If operators go a year or more without flying, they are essentially lame ducks when openings return. Fortunately, aviator jobs are out there right now, though most are not as sexy as piloting a Boeing Dreamliner on an international route. Cropdusters, parachute schools and aerial photographers need pilots. Air ambulance services, news organizations and offshore oil operations need them, too.

You've probably noticed how most of the above examples tend to involve rotorcraft. For many that may mean returning to flight school. Some pilots may balk at that commitment. But remember, only two jobs exist in this world: flying and non-flying.

As someone who first flew airplanes and later learned to fly rotorcraft, I can assure you that helicopter flight school is not only challenging but also fun. That second time around, I knew all about navigation, had a good scan, and was comfortable on the radio. However, that was about where the similarities stopped. I rapidly came to the realization that a helicopter just doesn't fly like an airplane. Speeds are slower, but additional physical coordination is required along with much more interaction with the ground. Terms like autorotation, ground resonance, and retreating blade stall were new and strange. I also learned to hover, that defining capability of all helicopters and the single most difficult challenge I have experienced in my aviation career.

I started my hovering lessons by trying to keep the aircraft within a small square drawn on the ground but usually wound up departing the airfield in embarrassing fashion before the instructor took over. Then, after just barely being able to keep the bird in the square, I was tasked to trace the square. Of course, the wind affected each leg differently, leading to beads of sweat the size of dimes running down the length of my body all while the instructor kept encouraging me to hang in there.

The entertainment didn't stop as radio calls and emergency procedures were added. An engine failure in a hover at five feet AGL doesn't leave much time to keep the helicopter from impacting the ground too hard, buckling the skids, and possibly rolling over. At first it was difficult to master, but after rereading the literature on helicopter aerodynamics (imagine that!), I found that a little forward right cyclic and some right pedal eliminated the drift. Then it was just collective to cushion the landing. Before I knew it, I was hovering without thinking about it and even performing additional tasks. Once I reached that point, I had to fight the urge to take my hands off the controls and wave at my friends in the students' lounge as they waited for their turn in the sweat box.

Regardless of a person's profession, going back to school is often a good option during hard times. So hang in there. If I could do it and learn to hover, there is hope for all of us.

Photo by Lynn A. Jensen

*Rory L. Rieger is currently a certification engineer for the Rotorcraft Directorate. He has served as a fixed- and rotary-wing pilot of both manned and unmanned aircraft for the U.S. Navy and Navy Reserve for 28 years. His career has included assignments with the Army, Air Force, USMC, Coast Guard, NOAA, foreign militaries and various foreign and domestic government civilian agencies.x*

# Flight Forum

## Excellent Issue!

I just wanted to drop you a quick line to give you feedback on the [Flight Standards, Nov/Dec 2013] issue. I have to say, I believe this is one of the finest I've read in a long time. Your discussion of the FAA's mission, the illustrations and discussion of the AVS organization were spot-on, and Susan Parson's "Postflight" was something I believe we've all felt and experienced but were unable to articulate how we felt about it. Overall just an excellent issue.

— John

*So glad you enjoyed the edition and found it educational. The opportunity to highlight our dynamic organization came up and we seized it. It was great fun writing about our fellow coworkers and we learned a few things ourselves in the process. Thanks again for the kind words!*

## Pixelation Problems

That FSDO poster (from Nov/Dec 2013 edition) will be a great resource for teaching my students how and when to interface with Flight Standards. Unfortunately, because of the way it was published, the map doesn't look very clear when printed out in large format. Can you make the map within the PDF a vector drawing instead of a bitmap? That way, it will look good at any size. Thanks!

— Conor

*We are pleased that you would like to use the tool as a training aid. The PDF poster was intended to be printed at 11x17, however, here is a link to a larger format.*

*www.faa.gov/news/safety_briefing/2013/media/FSDO-Map_NovDec2013.pdf*

*In the future, we hope to have a better interactive map on the FSDO Web page.*

## Something for the Rest of Us

Hello! I just wanted to say thank you for including so much material relevant to the rotorcraft community. So often we get left out, and it was refreshing to see you had many articles relating to the helicopter industry, technology improvements, and safety considerations. Keep it up!

— Theresa

*This is great to hear! We have made it a point to ensure the rotorcraft community has equal voice and input into FAA Safety Briefing and we definitely appreciate the feedback. We also welcome any additional ideas or safety-related concerns you might have and you may submit those to the same address, safetybriefing@faa.gov.*

## Airbus Befuddlement

In the article "Our Finest Hour" (Nov/Dec 2013 edition), the US Airways aircraft was referred to several times as being an A-321. It was actually an A-320. Also, the article states that the Aircraft Certification Service (AIR) issues airworthiness certificates for aircraft and parts which is not the case for parts.

— Paul

*You are absolutely correct. While we did research the information on US Airways Flight 1549, our source proved to be incorrect and for that we apologize. We also should have clarified in that same article that FAA's Aircraft Certification Service (AIR) does not issue airworthiness certificates for parts. Again, we apologize for any confusion this might have caused.*

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*FAA Safety Briefing* welcomes comments. We may edit letters for style and/or length. If we have more than one letter on a topic, we will select a representative letter to publish. Because of publishing schedule, responses may not appear for several issues. While we do not print anonymous letters, we will withhold names or send personal replies upon request. If you have a concern with an immediate FAA operational issue, contact your local Flight Standards District Office or air traffic facility. Send letters to: Editor, *FAA Safety Briefing*, AFS-805, 800 Independence Avenue, SW, Washington, DC 20591, or email SafetyBriefing@faa.gov.

***Let us hear from you — comments, suggestions, and questions: email SafetyBriefing@faa.gov or use a smartphone QR reader to go "VFR-direct" to our mailbox.***

SUSAN PARSON

# No Time Like the Present

You've probably heard the story of *Everybody, Somebody, Anybody,* and *Nobody.*

> *Everybody* was sure that *Somebody* would do the job. *Anybody* could have done it, but *Nobody* did. *Somebody* got mad, because it was *Everybody's* job. *Everybody* thought *Anybody* could do it, but *Nobody* realized that *Everybody* wouldn't do it. *Everybody* blamed *Somebody* when *Nobody* did what *Anybody* could have done.

I've always liked that story, because it's such a pithy reminder of how we can so easily assume that "somebody" will take the job that "anybody" could do. Over the years, I have also adapted it to the concept of finding or, more accurately, making the time for things I say I want to do. I have the best of intentions. Really, I do. *Every time* I think about it, I am positive that *Sometime* I will get around to it. I know that *Anytime* offers a perfectly good place to start. But another day slips by and I realize I have found *No time* to get started. The cycle continues. Days become weeks, months, years, even decades.

**Call your FBO. Book the airplane. Hire an instructor. You'll have the time of your life.**

## Filling the Bucket List

What broke the cycle for me was a medical issue (see Jan/Feb 2013 issue of *FAA Safety Briefing*) that motivated me to think hard about doing rather than just dreaming and vaguely planning. I am blessed that my particular issue, relapsing-remitting MS, has mostly stayed out of my way. But it doesn't ever go away, and it therefore provides a constant and very beneficial reminder that *Sometime* is always anchored in an uncertain future. Time to recast the "tale of the Times" in a slightly different way:

> *Every time* I think about a goal I want to pursue, I recognize that *Sometime* I might not be in a position to achieve it. If *Anytime* will suffice, there is *No time* like the present to get started. And getting started is key to ensuring that *This time* will have a positive outcome.

Being an inveterate list maker, I started by creating my own personal bucket list (*The Bucket List*, by the way, is a great movie if you're on the hunt for a good Friday night flick). There were two big aviation-related items on the list. First was to earn my ATP certificate. Second was to sign up for the specialized upset recovery training course recommended by one of the many aviation publications in my mailbox.

I didn't just list things, though. I also added "start by" and "complete by" dates to each item. Next, I listed the specific steps and actions that would create momentum, which would in turn generate progress. I put the big items in priority order. Then I started marching down the list, happily checking off each step.

As the magical Mary Poppins likes to say, "Well begun is half done." And so it was. Getting started created momentum and motivation for the focused effort each goal required. I passed the ATP checkride just before Thanksgiving that year. Soon after, I transformed *Sometime* into a *Set time* by booking dates for the upset recovery training — one of the best, most educational, and absolutely fun things I've ever done. In fact, I had the time of my life — and I went back for more.

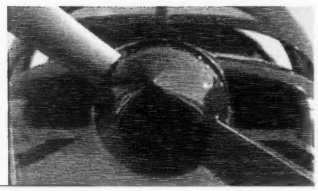
## The Time of Your Life

This issue of *FAA Safety Briefing* is dedicated to offering encouragement and guidance on getting back into the flying game if, for whatever reason, you've been away for a while. If you find yourself playing the *Sometime* game, I'd like to encourage you to act on the idea that there is *No time* like now to make it happen. Call your FBO. Book the airplane. Hire an instructor. I promise you'll have the time of your life — and you'll go back for more.

*Susan Parson (susan.parson@faa.gov, or @avi8rix for Twitter fans) is editor of* FAA Safety Briefing. *She is an active general aviation pilot and flight instructor.*

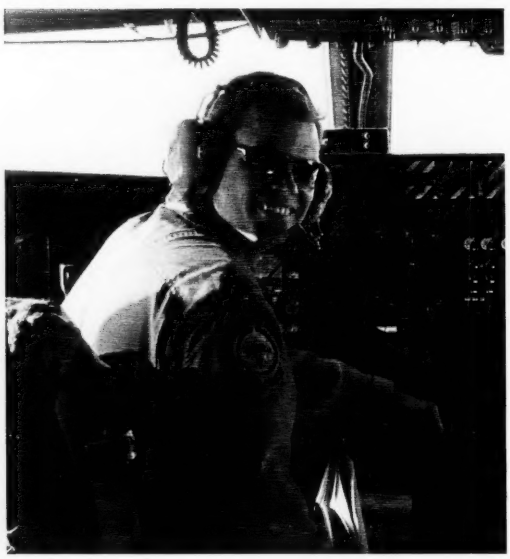
PAUL CIANCIOLO

# FAA Faces



## Brian Hint

***Aviation Safety Inspector, Flight Technology Requirements Branch***



When Brian Hint realized that "chicks don't dig dudes who play the flute," he transitioned from playing in a jazz/hip-hop/funk band for five years to earning his private pilot certificate in 2000. He then moved back home to New York's Long Island to earn his instrument rating after his father, a certificated flight instructor-instrument (CFII) and former U.S. Navy fighter pilot, bought an old Zlin 242-L two-seat trainer and acrobatic airplane.

As you might imagine, Dad was a demanding teacher. "Brian, if you can hold 30 feet high, then you can hold 30 feet lower and be on attitude!" his father would instruct. "Know your equipment!"

Hint followed in his father's footsteps by going into military aviation. He joined the New York Air National Guard, where he learned to fly the C-5A *Galaxy*. In 2010, he became an aviation safety inspector (ASI) with FAA headquarters in the Flight Technology Requirements Branch, which is part of the Flight Technologies and Procedures Division in the Flight Standards Service. In this position, Hint coordinates policy that allows operators to utilize electronic flight bags. He is the lead for aeronautical information standards development.

"Knowing that the policy you generate will be utilized by the aviation community is extremely rewarding," notes Hint. "This job is awesome!"

On the side, Hint currently flies the C-5M *Super Galaxy* with the U.S. Air Force Reserves. It is the most enjoyable part-time job one could ask for. Flying the massive "cumulus aluminus" is more complicated than his wife thinks — "with three buttons to press: takeoff ... cruise ... land." On average, the C-5 has three crewmembers working together continuously to keep the massive aircraft safely airborne. It's a team effort.

But after recently flying in his father's Beechcraft *Bonanza*, Hint again remembered what it was like to be in total control of an aircraft and to have to fly and talk at the same time — good skills for any pilot to maintain. Although the *Super Galaxy* could swallow a Bonanza, he is working to transition back to GA for the sheer fun of flying.

"It's funny how it took me 2,500 hours flying general aviation (GA), military, and airliners to realize that the best flying of my life was flying GA," said Hint. "I took it for granted, and it would be wonderful to get back into flying GA again." That's the plan.

Hint recently looked into renting a Cessna 152, the first aircraft he learned to fly, and experienced a case of sticker shock. "The cost of training has changed so much over the last 14 years. When I started flying back in 2000, I could rent a Cessna 152 for $50 an hour wet!" Cost was an issue back then, but it wasn't a reason not to fly. Not so today. Hint's salary is higher, but so are the expenses that go along with having more responsibilities.

**It's funny how it took me 2,500 hours flying general aviation (GA), military, and airliners to realize that the best flying of my life was flying GA.**

Those additional responsibilities also create challenges to finding the time for GA flying. Happily, though, Hint recently got some information on the Civil Air Patrol, which seems like a perfect mix to support the community, get a break from the high cost of renting an airplane, and fly in an environment that is really fun. "Now all I have to work on is finding a little more free time to make it happen."

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*Paul Cianciolo is an assistant editor and the social media lead for* FAA Safety Briefing. *He is a U.S. Air Force veteran, and a rated aircrew member and search and rescue team leader with the Civil Air Patrol.*

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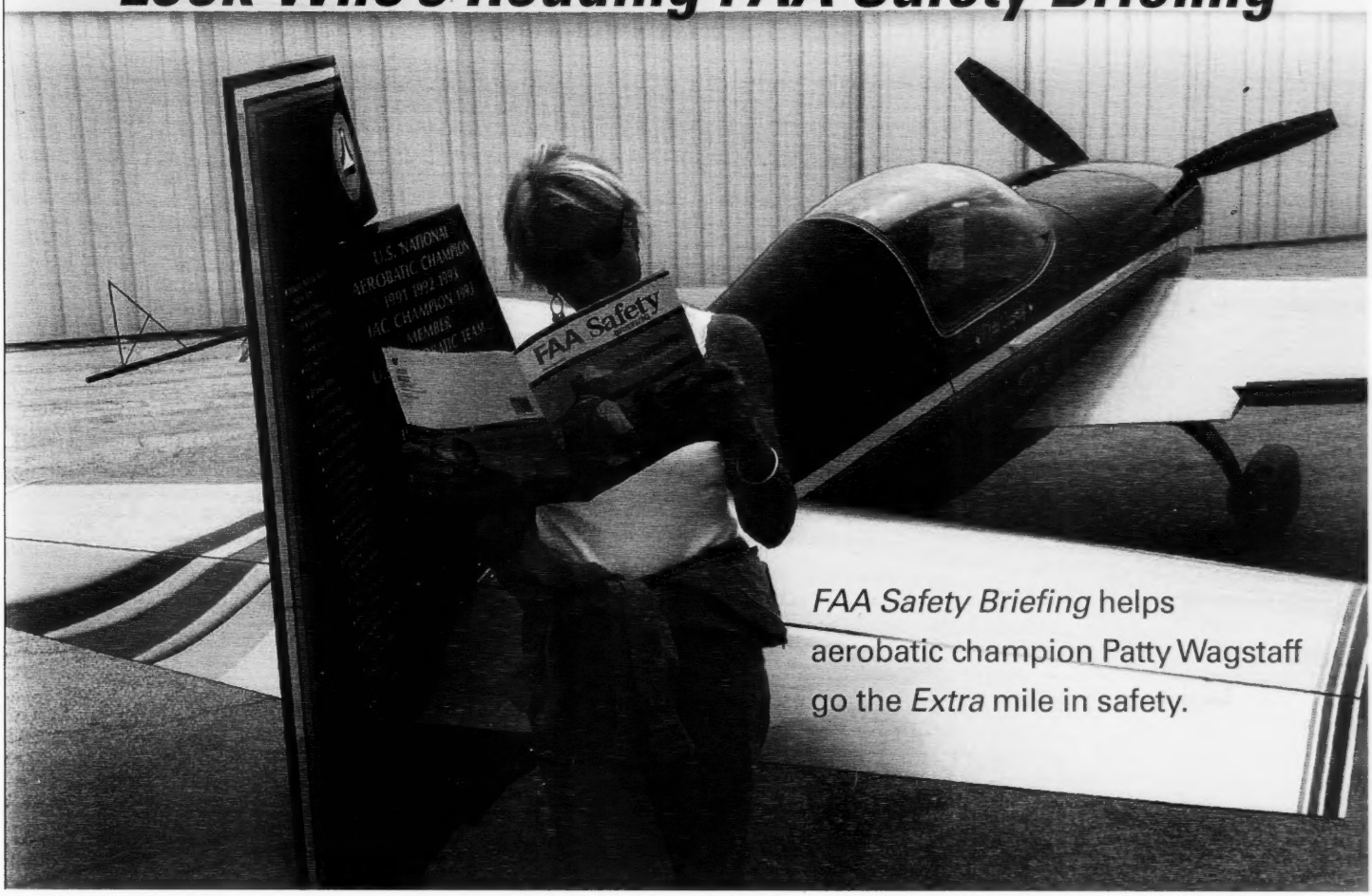
# *Look Who's Reading FAA Safety Briefing*




*FAA Safety Briefing* helps aerobatic champion Patty Wagstaff go the *Extra* mile in safety.